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Three types of storage are seen in Southern Counties Gas Co.'s holder station at Monrovia, Calif.—four new vertical high pressure units, one of two horizontal high pressure units, and the original low pressure holder.

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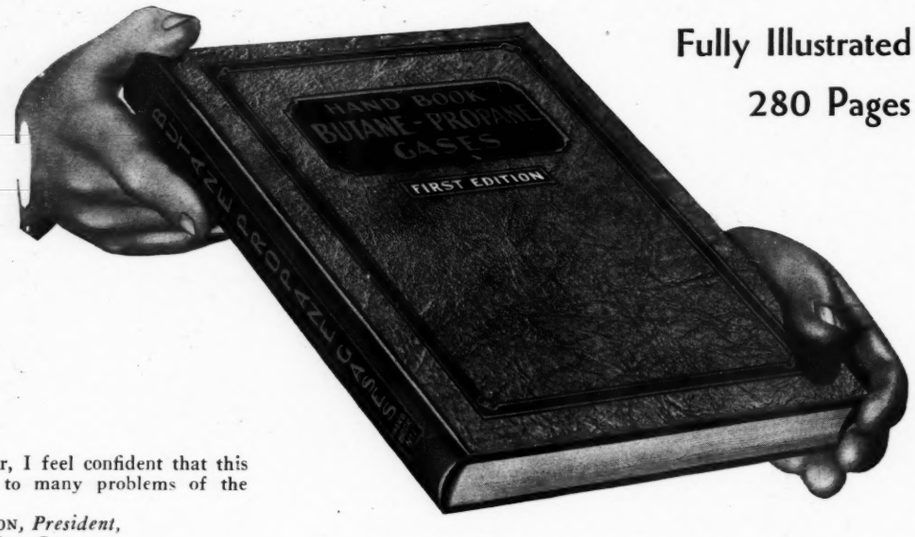

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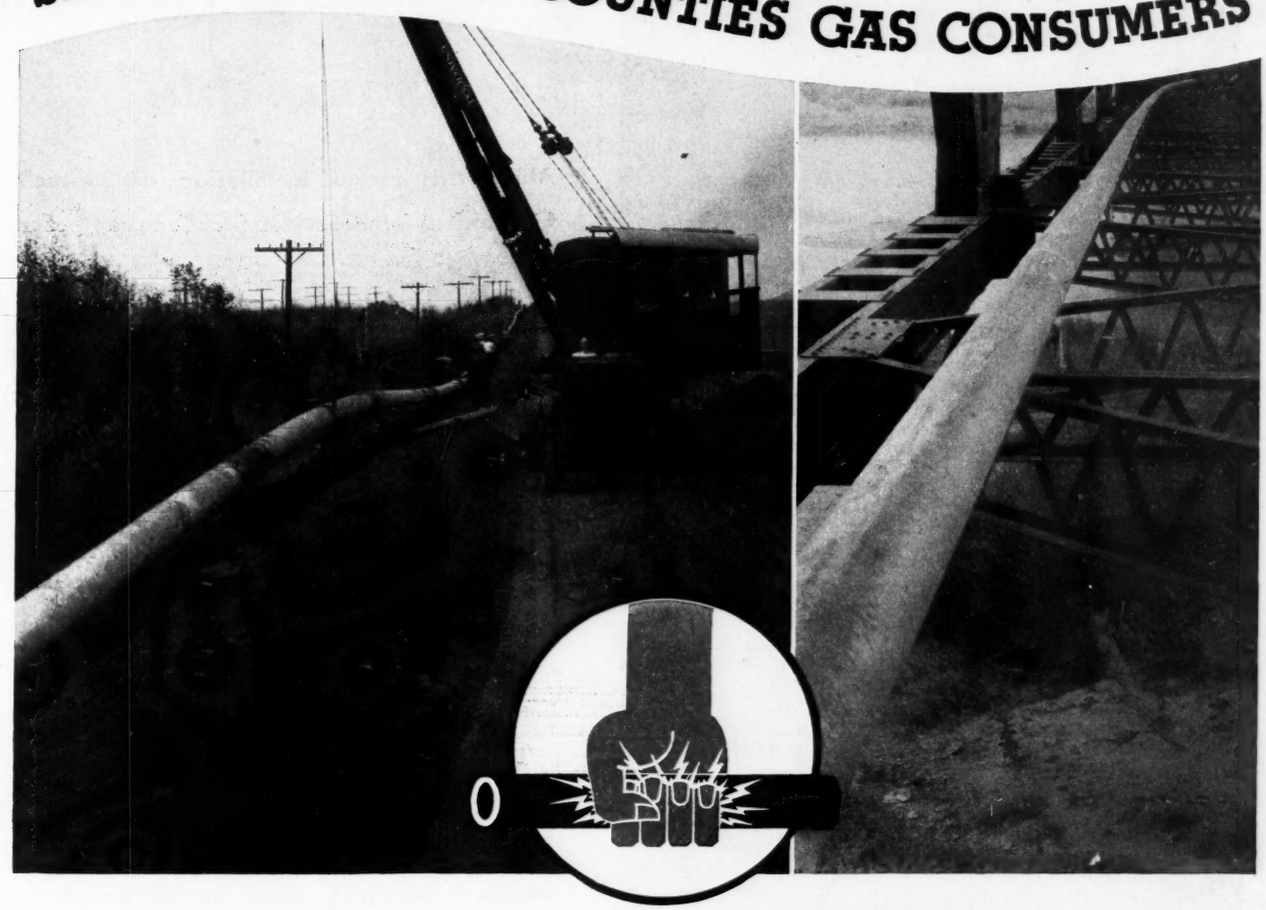

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January, 1933. Volume IX, Number 1. Western Gas is published by Western Business Papers, Inc., at 124 West Fourth Street, Los Angeles, California. Subscription price (in advance) 20 cents the copy; $2.00 per year; 2 years, $3.00; $3.00 per year foreign. Entered as second class matter June 1, 1925, at the postoffice at Los Angeles, under the Act of March 3, 1879.

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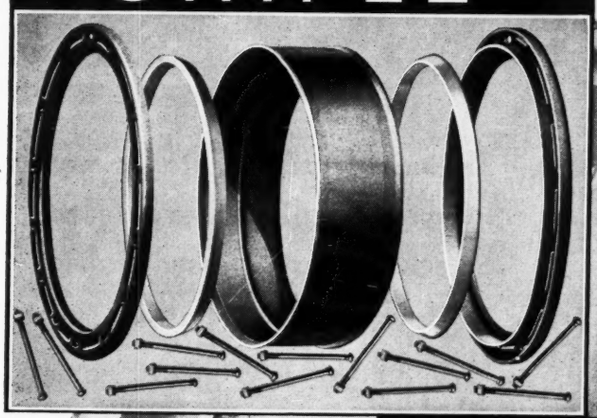

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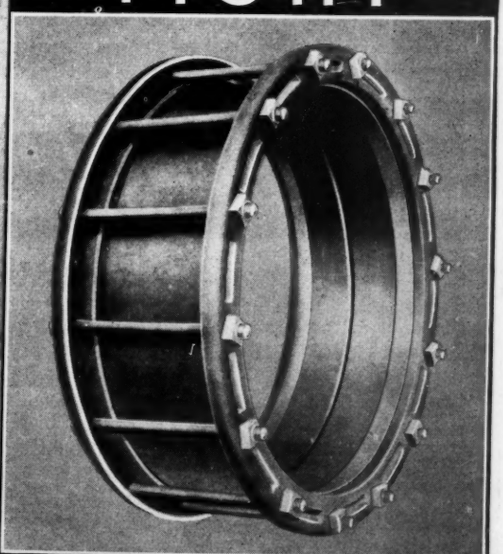

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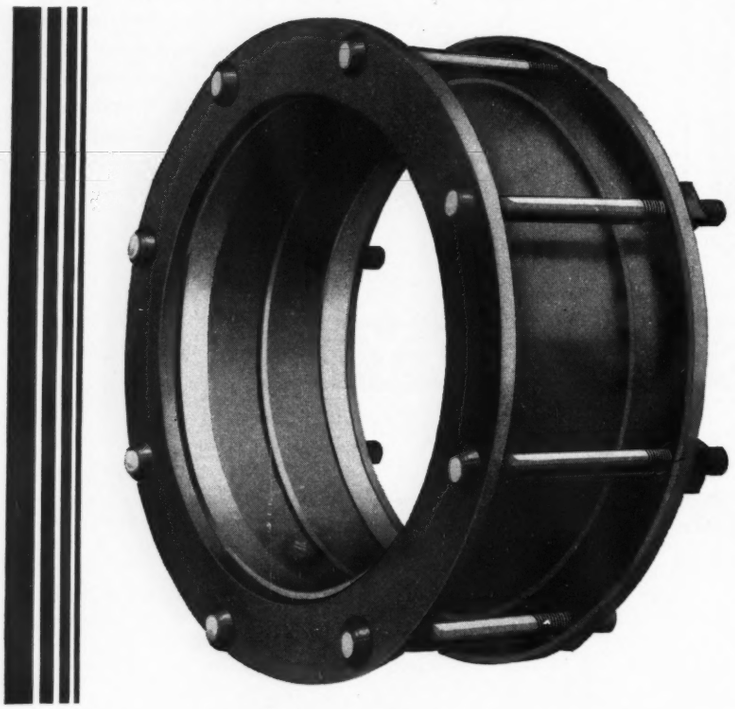

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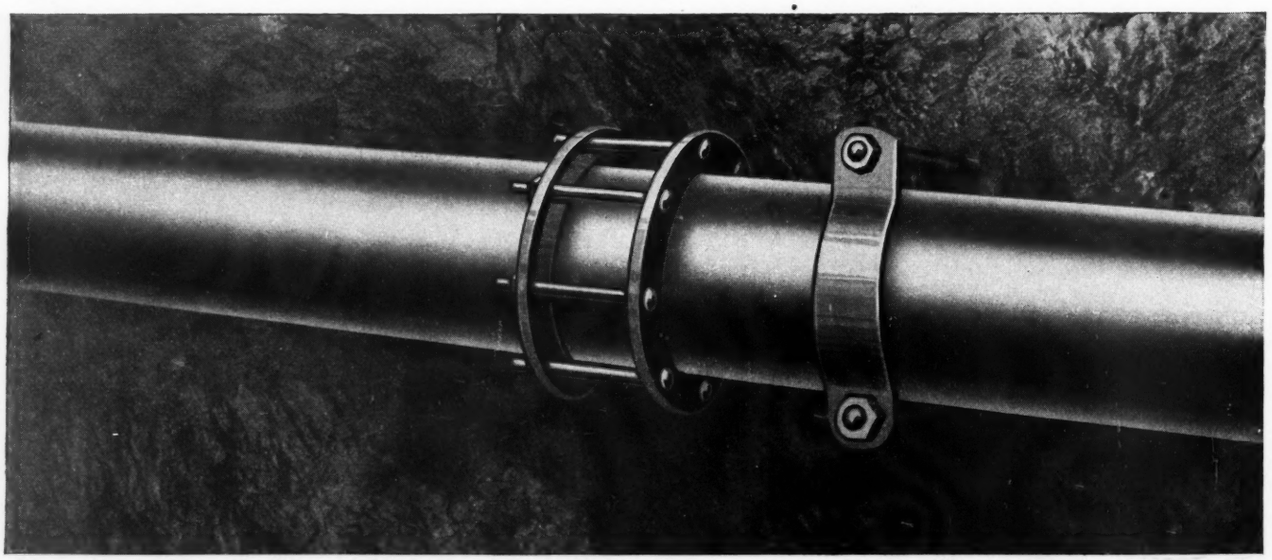

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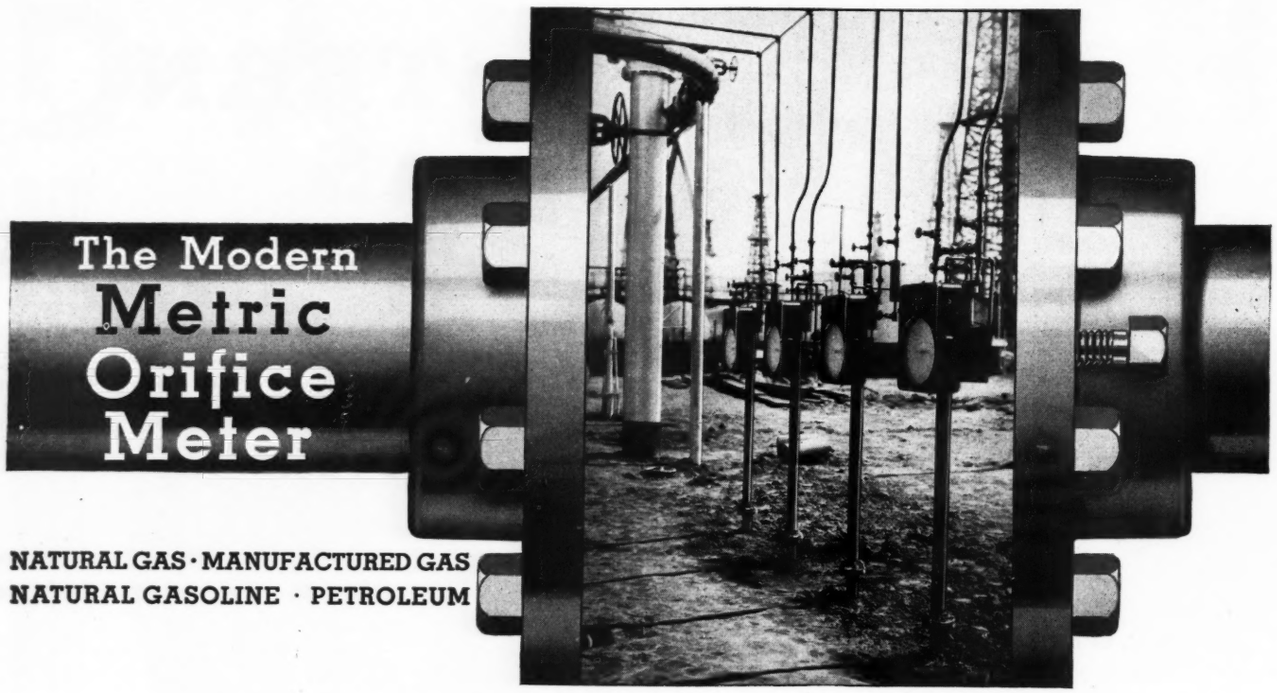

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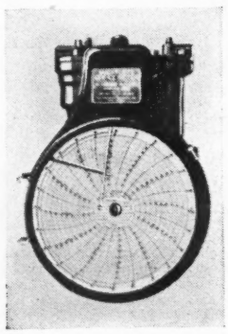
Ask for Bulletins E-2, E-3 and E-16, which describe Metric Orifice Meters, Metric Indicating Flowmeters and Metric Integrating Orifice Meters respectively. From these and from past and present installations you may see for yourself why these meters have led in dependability over such a long term of years.



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January, 1933

WESTERN GAS

Vol. IX, No. 1

"Reg. U. S. Pat. Off."

A Monthly Journal of the Gas and Gas Appliance Industries in *Western America*

Review of the Month

Gas Displays at the Chicago Exposition

Engaging 4,000 square feet of exhibit space at Chicago's Century of Progress Exposition, the A. G. A. now has under consideration details for its gas industry display, according to C. W. Berghorn, director of exhibits for the Association. Location of the exhibit will be in the Home and Industrial Arts Building; it will convey a general picture of the gas industry, leaving equipment displays to the individual manufacturers who may contract for separate exhibits. Several of these will also be housed in the Home and Industrial Arts Building, and eight model homes in which gas will be used will be built around the same structure. A number of stove manufacturers will exhibit in connection with a porcelain-enamel display. "Gas, the Ideal Fuel for Home and Factory" will be the A. G. A. exhibit theme.

1932 Sales and Revenue Losses Relatively Small

News of national decreases in gas sales and revenue totals brings no surprise to the industry; on the contrary, considerable encouragement comes from the fact that losses in most cases were small, and that gains showed in some classifications of gas use (see page 27). Year-end totals provided by the American Gas Association's statistical department show a 5.1 drop in manufactured gas revenues from 1931, with 4.8 loss in total sales. House heating sales of manufactured gas were an exception, showing 2.7 per cent gain. Natural gas sales for the domestic and commercial classes fell off only 5.4 per cent, but as was to be expected the industrial usage shrank more sharply, by 15 per cent. Non-utility sales (largely for carbon black manufacture and oil and gas field operations, both of which industries were at low level in 1931) declined 21.7 per cent, leaving the net loss in natural gas sales in the neighborhood of 16 per cent. Losses in the industry's customers were considerably less in proportion to other decreases — 3.3 per cent for manufactured gas; 1.1 per cent for natural gas.

Growing Tax Bills Should Be Challenged

In California the State Tax Research Bureau has recently issued a report recommending an addition of 3½ per cent to the state tax rate upon gas and electric companies—something in the nature of $5,800,000 above what is now being paid. This line of thought on the part of state experts calls for vigorous protest, and prompts some utilities to let the public know just what present taxes amount to. Pacific Gas and Electric Co. in December news releases points out that it paid in national, state and local taxes last year, the sum of $9,608,-210, not counting the Federal 3 per cent electricity tax levy recently adopted. Of this tremendous amount, $6,251,151 went to the state, $2,816,476 went into Federal tax payments, and $540,583 covered franchise and other local taxes. The proposed addition would raise state taxes upon gas and electric companies to 11 per cent.

P. G. and E.'s statement calls attention to the economies which utilities, during the past months, have shown in every operating item except taxes, and demands corresponding economies in state government. It also calls the state tax experts to account for exempting publicly owned gas and electric properties from taxation, to the amount of some $2,000,000 yearly.

Gas Industry "Alive to Its Future"

The gas industry enters the year 1933 with full realization of its problems, and with complete determination to hold and extend its service to the public.

Plans of the American Gas Association's National Directing Committee composed of foremost executives of the industry, for a comprehensive national program; activities of gas range manufacturers and other groups; steady pursuance of research; continued insurance of safe and efficient appliances in the home and automatically controlled appliances in industry are some of the most apparent proofs that the gas industry, already essential, is alive to its future and to the needs of reviving industry.

ALEXANDER FORWARD,
Managing Director,
American Gas Association.

Heaviest Sales Effort Due In Coming Year

A 52-million dollar gas appliance market in Northern California—and this in an area where the Pacific Gas and Electric Co. has for years maintained an enterprising activity of dealer and direct sales—was revealed by P. G. and E. sales executives last month (see page 15). Unsold markets prompt this aggressive company to put the largest promotional force of its history into the field in 1933, supported by the largest advertising budget ever set up, and to redouble its productive dealer-cooperative efforts.

Natural Gas Dispatching

In Northern California

By R. T. PETERSON

Chief Gas Dispatcher
*Pacific Gas and Electric Company**

NATURAL gas is delivered through two large diameter transmission lines, from Kettleman Hills gas fields, giving service to approximately 468,000 domestic, commercial, and industrial gas customers of the Pacific Gas and Electric Co., and approximately 18,000 customers of the Coast Counties Gas and Electric Co., as well as oil refineries of the Associated, Shell, Standard, and Union Oil companies, three large steam driven electric generating plants and several small steam heat plants of the Pacific Gas and Electric Co.

The two transmission lines having a total delivery capacity of approximately 200 million cubic feet per day run parallel from Kettleman Hills for 40 miles, and then separate, one following the western side of the San Joaquin Valley terminating at the San Pablo Terminal located near Richmond. This line is 198 miles in length, consisting of 20-, 22-, 24-, and 26-inch O.D. pipe. The other line is 147 miles in length, consisting of 20- and 22-inch O.D. pipe, and crosses what are known as the Panoche Hills and then through the Santa Clara Valley, terminating at the Milpitas Terminal, located near San Jose. From this terminal a 22-inch line 36 miles in length ties into the Valley Line at the Tracy Terminal. The Milpitas Terminal is the meter and regulator station for a 20-inch line 45 miles in length feeding the city of San Francisco and peninsula towns, and a 20-inch line 54 miles in length which feeds Oakland and other East Bay cities and towns. Gas is also delivered to the latter from the Valley Line at the San Pablo Terminal, where the two are tied together.

From Kettleman Hills south, a 16-inch line approximately 51 miles long, ties into the Buttonwillow gas field. Although this field has a large potential supply, no gas is being delivered from it at this time.

Following each of the large transmission lines is a telephone line, with connections to the patrol stations, having also a drop for connecting portable sets at each main line valve. These are used by the men out on patrol and during repair of line breaks, etc. All transmission in connection with dispatching and operating these lines is handled over this telephone system.

In addition to the large pipe lines from Kettleman Hills, there are smaller diameter transmission lines and a network of distribution mains totalling approximately 6,200 miles, in the cities of San Francisco, Oakland, San Jose, Stockton, Sacramento, and some 125 smaller cities and towns in Northern California.

Gas Sales Increase

Since the introduction of natural gas in August, 1929, consumption in this territory has increased from 22½ billion cubic feet of 550 B.t.u. manufactured gas for the year 1928 to 58½ billion cubic feet of 1190 B.t.u. natural gas for 12 months ending October 31, 1932.

To meet this rapid growth over such a large territory, and to give satisfactory and continuous service, it is, of course, necessary to estimate the future demand and plan for expansion and development of facilities.

To the man in the operating department, satisfactory and continuous service means service without interruption and good pressure regulation during the 24 hours of the day. To attain this end, it is essential to have service men, pipe line repair crews, compressor station operators, pressure tenders, and many others working in cooperation.

It is also necessary to estimate daily, as accurately as possible, the requirements for one or more succeeding days,

*Presented before the annual Organization Conference, Pacific Coast Gas Association, San Francisco, Calif., December 14-15, 1932.

PACIFIC GAS AND ELECTRIC CO.—CALCULATION SHEET TO DETERMINE GAS REQUIREMENTS EXCLUSIVE OF LARGE VARIABLE LOADS NOT AFFECTED BY TEMPERATURE Month of.....193..

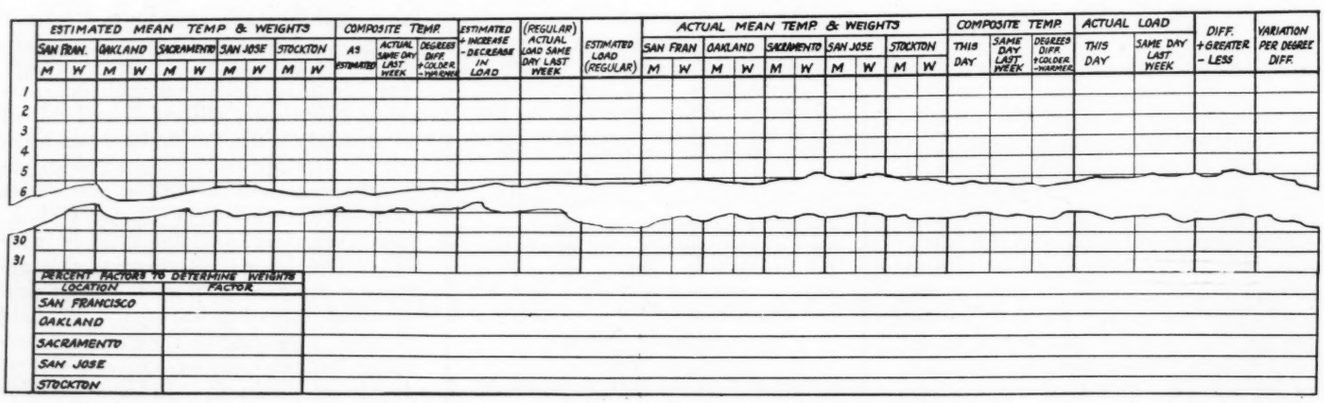


Fig. 1.

and to direct the operations necessary to maintain the desired pressures and volumes in the various lines. This is the chief function of the gas dispatching department.

Personnel and Duties

To avoid confusion with the dispatcher's office in the company's Electric Department, the name of Gas Control is used. The Gas Control Office located in San Francisco consists of a personnel of chief dispatcher, assistant chief dispatcher, and five shift dispatchers. The primary function of this office is to direct the amount of gas flowing and the pressures to be maintained at all times at terminals, stations, and other points of control. The second function is to estimate daily the requirements for one or more succeeding days.

The shift dispatchers, in addition to directing the amount of gas flowing and pressures to be maintained in various lines, receive, record, and dispatch hourly meter, pressure, storage, weather reports, etc., from the company's various plants, meter and regulator stations. From these readings, hourly sendout reports are determined for various sections and for the system as a whole. The readings received and reports which are compiled from them make a total of approximately 185 log entries each hour.

In addition to the hourly reports, daily, weekly, monthly, and annual reports of production, transmission, and distribution are made.

The operators at the meter and regulator stations have meter and pressure gauges to read each hour, calculations to make of the hourly volumes of gas for the various lines at the station and other points along the lines. They also operate valves and regulators to maintain the pressures and flowing volumes in the lines, as directed by the gas control. At each of these terminals, namely, Milpitas and Tracy, there are four operators, with one acting as a relief man.

The personnel of the Gas Control Department at Kettleman Hills consists of a head field operator, assistant, and four shift operators. The duties of the shift operators are practically the same as for the operators at the terminals, except that, in addition, they have to contact the plants of the various producing companies in the oil fields periodically, for meter readings to determine whether or not they are delivering gas to the lines in accordance with the producing schedule, as directed by the Gas Control Office in San Francisco.

The head field operator is in charge and has, in addition to many other duties, the job of going to the offices at the various gasoline plants each morning to check the charts and calculations made, to segregate the dry gas delivery from the plants for the previous day, and credit the proper amounts to the accounts of the various producing companies delivering gas. One other job is to collect data to make reports each week relative to production of oil and gas, and drilling development for every operator in the Kettleman Hills and fields adjacent. These tasks are very difficult, requiring a man with a thorough knowledge of oil well drilling, plant operation, gas measurement, and other oil field practices.

Map showing major gas transmission lines in Northern California.

Estimating Requirements

Referring again to the Gas Control Office in San Francisco, probably one of the most important and difficult problems to solve in connection with the dispatching of gas is that of estimating what the requirements are going to be on the succeeding day. It is difficult to solve because the changes in the load, with the exception of the industrial load, are dependent upon the changes in weather. It is important for several reasons, the most important being: First, in our case, a change in delivery at Kettleman Hills is not felt in San Francisco or Oakland for approximately six hours from the time the change is made, due to the distance the gas must travel. Second, the wells in the Kettleman Hills producing gas and oil, which, of course, are very inflammable, have a very high well pressure, and are very deep and costly to develop. To reduce the danger involved in changing the production of wells, the producing companies have established a rule that no changes will be made at night and not oftener than once in 24 hours, excepting in cases of pipe line breaks, fires and other such emergencies. The gas companies realize the danger and fully appreciate their problem, cooperating in every way possible. Third, we have a transmission line capacity available as storage in an amount equal to the total amount stored when the line is operating at its maximum capacity, less the amount necessary for continuous flow straight through at the rate of delivery from the field. In addition, we have a holder storage capacity in San

(Continued on Page 22)

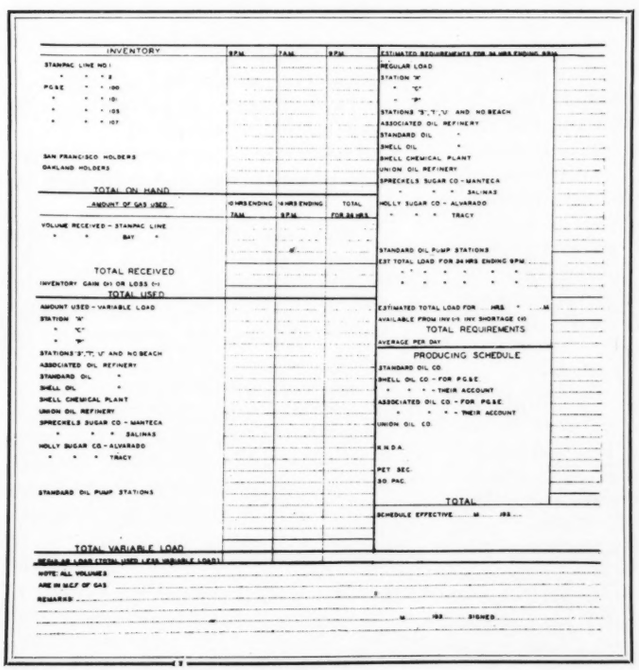
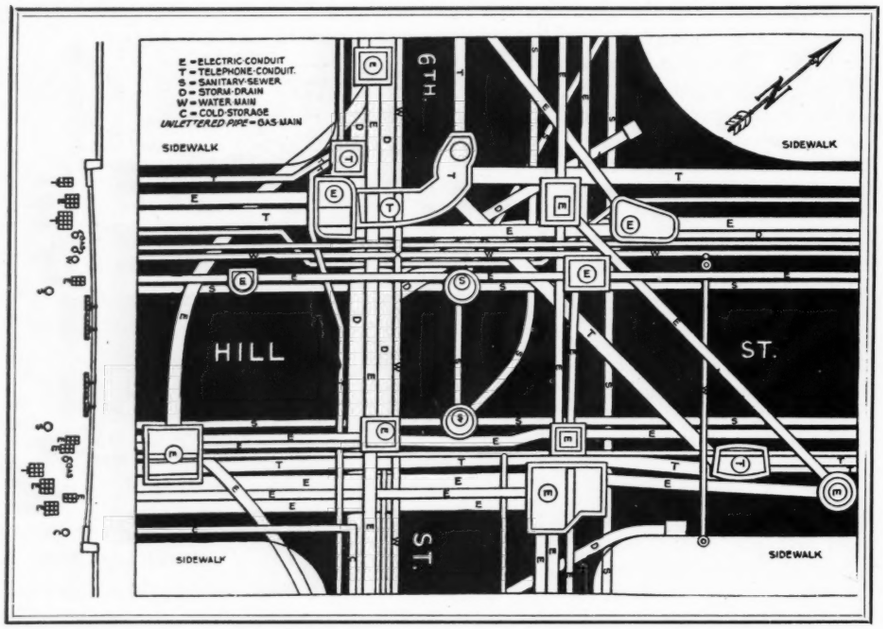


Fig. 2—Load Sheet.



This diagram of substructures at Sixth and Hill Streets, Los Angeles, is a good example of the complex design, construction and maintenance problems which face distribution engineers in metropolitan areas. In addition to the structures shown above, double-track railway and interurban tracks are also located at this point.

A Forum For Substructure Problems

By W. M. HENDERSON

Superintendent of Distribution
Los Angeles Gas and Electric Corporation

LOCATION and maintenance of pipe, conduit and other equipment for utility service beneath the surface of metropolitan streets introduces many problems. Frequent conferences between the several utilities involved, and decisions from proper municipal authorities are necessary in connection with street opening, widening and repaving. In a few centers the problem has been met by setting up a permanent agency to bring together the several interests on sub-structure problems. One of the first of such agencies is the Substructure Committee which has been operative in the City of Los Angeles since early in 1926. The committee is serving a highly useful purpose as an advisory board on substructure matters, and its functioning is described briefly below.

The committee came into being under the auspices of the Bureau of Engineering, with the authorization of the Board of Public Works, City of Los Angeles, on March 17, 1926. Each utility serving in Los Angeles was invited to become a member of the committee, and to appoint representatives to attend regular meetings. Each member was to furnish one representative for each class of sub-surface structure maintained by it in public streets.

An immediate response was made by the utilities, and membership of the committee now represents gas, light, railway, power, telephone, telegraph, oil, water, refrigeration and other utilities which use the streets for substructures required in rendering public service, as well as some maintaining sub-surface structures for private purposes. Representatives from every city and county department affected in substructure work are also members of the committee.

D. N. True, office engineer of the Bureau of Engineering, has served as chairman of the committee since its inception. Meetings are held regularly, on the second Monday of each month. They provide opportunity for the utility representatives to correlate their problems with those of other utilities and with city contractors, in consultation with city and county authorities, with the result that mutual ends are reached quickly and with a minimum of confusion.

For the committee's purposes the term "substructure" is defined as a sub-surface structure, railroad track, subway, tunnel, conduit, pipe or any other plant or equipment erected and maintained partially or wholly beneath the surface of streets for public or private use, as permitted by law.

W. M. Henderson

Objects of the committee are stated as follows in its constitution and by-laws:

To cooperate with the Bureau of Engineering of the City of Los Angeles for the purpose of proper installation of all sub-surface utility construction in public streets;

To study problems of and make recommendations on street improvement programs with the idea of eliminating the necessity of opening streets after new pavement is laid;

Proper construction and allocation of sub-surface structures in connection with the construction of subways;

The allocation of various utility structures to proper places in sub-surfaces of streets;

Through coordination of effort on the part of all interested utilities, to so organize the work to be done prior to the improvement of the street surface, that completion of the entire program may be expedited;

To develop a proper understanding of the various utility problems involved in sub-surface construction for the benefit of all concerned—the public, the city authorities, contractors and the utilities.

Recommendations of the Substructure Committee are advisory only, and to become effective must have the approval of proper legal and legislative authority.

To indicate the numerous city and county agencies which are concerned with sub-surface work, the committee

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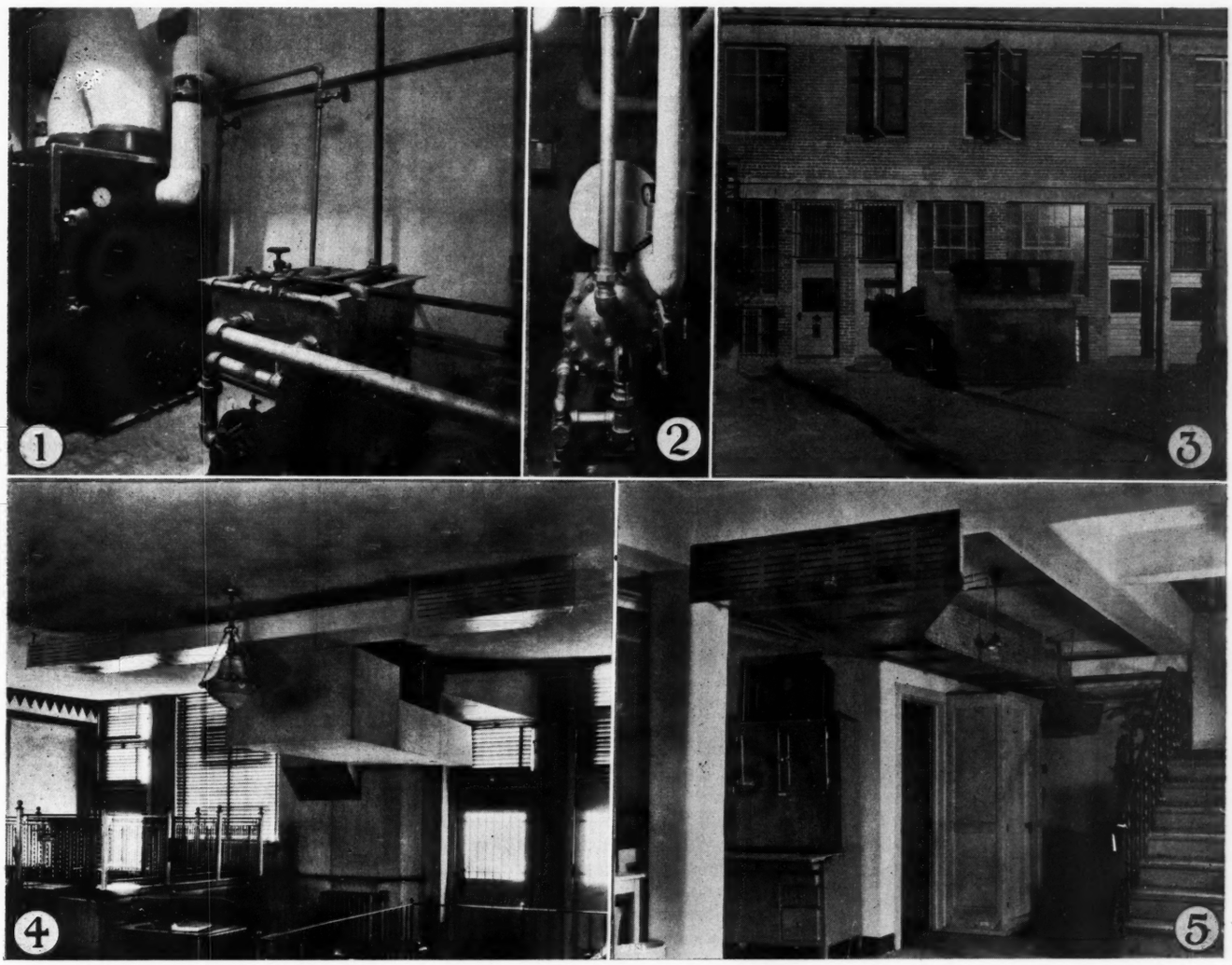

Air-conditioning equipment in Country Club office of Kansas City Gas Company.

Set to *Sell* Air-Conditioning

FOR the past year there has been more than a little optimistic discussion under the head of gas sales for air-conditioning, and the consequent improvement in load factors which will follow summer cooling and winter heating by gas. This forecast of a coming development is reminiscent of the early stages of gas refrigeration. Definite inauguration of refrigeration sales work waited for many months upon the improvement of equipment, the working out of sales and delivery facilities by manufacturers, and the building up of the gas refrigeration complex in the industry's thinking. This is the present level of gas sales for air-conditioning: What equipment organizations need at this stage is some concrete indication that the gas industry is prepared to incorporate air-conditioning in its sales program; what gas companies need is the assurance that efficient, serviceable equipment which will operate at competitive costs, will be ready for their sales efforts.

In line with this reasoning it is encouraging to follow the work of a few gas companies which are now taking air-conditioning out of the field of theory, and are laying their plans to add some of this potential load to their lines. One of the few companies which have gone beyond the preliminaries with air-conditioning is the Kansas City Gas Co., and the paragraphs below give a brief resume of this organization's present set-up for promoting sales in this new field.

During the past summer the Gas Service Co., of which the Kansas City Gas Co. is one of the chief distributing units, made arrangements with the Carrier Lyle Division, Carrier Engineering Corp., manufacturer of a commercial and residence cooling and air-conditioning gas system, to act as agent for this equipment in its service area. One of the first steps was to install one of the complete commercial systems in the Country Club office of the Kansas City Gas Co., located in the Country Club Plaza, Kansas City, Mo. This demonstration unit was put in last August and is expected to prove of much sales im-

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SEVERAL of the program features given at the 12th Gas Meter School and Conference, at Ames, Iowa last month appear in this issue of *Western Gas*. The Ames school is one of the oldest of short courses in its field, and has done much to better gas practice in its territory. It is conducted as a joint activity of the Mid-West Gas Association and the Iowa State College Engineering Extension Service.

This year attendance at the school came to 135, registration being made up largely of men from the several states in Mid-West Gas Association territory—Iowa, Nebraska, Minnesota, North and South Dakota. The sessions covered four days, December 6-9.

As was the case at last year's school, problems related to introduction of natural gas were given the limelight in the program. Mr. Mathias' paper on "Fogging Oils" published on this page, is typical of this class; other kindred topics were change-over methods, house heating conversion, servicing house heating installations, etc. In addition, a number of papers dealt specifically with meters. The conference as a whole is regarded as one of the most beneficial which has been held.—*Editor.*

Fogging Oils

By H. R. MATHIAS

Technical Division, Standard Oil Company, Chicago

IN THE change-over from manufactured gas to natural gas or mixtures of the two which has been made by many gas companies in the past few years, difficulties in operation have resulted and in most cases a marked increase in the amount of gas leakage has occurred. Fogging oils secured from petroleum are today being used to combat the difficulties arising, and judging from the interest so far displayed, have been of considerable merit.

Manufactured gas as it leaves the work outlet is saturated with water vapor and contains in addition tar fog, naphthalene, benzol and other light oil vapors and hydrocarbons. The temperature at this point is usually considerably above the temperature of the mains, hence some of the vapors become condensed and are deposited in the mains. The entire system therefore becomes saturated and every substance is filled with water or light oils. In cast iron pipe joints especially, jute or hemp after years of service on this gas is saturated, sealing what might otherwise be small leaks. Valve stem packings are also saturated and made gas tight. Rubber swells in contact with light oils, becomes honeycombed and oil saturated. Dust and rust deposits are wetted down.

Natural gas on the other hand differs from manufactured in being unsaturated with either water or oil vapors. It may contain a small amount of these vapors as it leaves the well but after compression and transmission through several hundred miles of line, the vapor content is reduced to a very low figure. By the time the dry gas reaches the old manufactured gas mains it has a very great affinity for water and light oil. Consequently, within a comparatively short period of time, all water and light oils are absorbed from the system, leaving dry jute, and hemp in pipe joints, dry porous rubber, shrunken valve packing, open pores in the pipes, and dust and rust deposits which have become dry and loosened and are, therefore, carried along with the gas stream.

In addition to the mechanical troubles which are caused by the loosened dust deposits, the leakage of gas increases enormously, having increased from 250,000 cu. ft. per mile of 3-inch main to 2,000,000 cu. ft. per mile in one case. This gas leakage is, of course, important from an economic standpoint, although it does not involve any serious operating difficulty. In various compressor stations daily shut-downs of compressors have been made necessary by dust in order to regrind and clean valves, to say nothing of frequent replacement of worn rings and liners. Dust also interferes with the action of orifice meters, and positive meters frequently fill up until they cease to operate.

Two methods of treatment are available to overcome the difficulties above enumerated; either rebuild the system or oil fog. Rebuilding of the system requires inspection of all joints, replacement of couplings and gaskets, valve stem packing, meter and pressure regulator diaphragms and installation of dust traps. Oil fogging requires saturating of the gas with oil fog to 200 per cent or more by means of the various devices now marketed or which could be made.

The comparative costs of rebuilding and oil fogging are greatly in favor of the latter plan. Oil fogging can be done at a cost of not more than 1/10th of a cent per 1,000 cu. ft. Oil fogging, of course, cannot be expected to replace dust traps entirely but the film of oil which is deposited will greatly aid in keeping dust and rust deposits already present in the pipes from being carried along by the gas stream.

Steel pipe systems with welded or threaded joints should be free from leaks with either manufactured or natural gas, although dust will be of importance especially with natural gas systems close to the origin.

Two methods are in common use for injecting fogging oil into the gas stream. One method makes use of atomizing jets through which gas is passed at high velocity and oil is aspirated and broken up into fine droplets. The other method depends upon vaporizing a certain amount of the oil into part of the gas stream and returning the vapor-laden gas to the main stream whereupon the oil vapors condense to form a very persistent fog. No attempt will be made here to discuss the various makes of foggers as represented by different manufacturers or the relative merits of the two types. It has been stated that the injection of oil into the gas main through the agency of commercial nozzles fails to disperse the oil to suitable fineness, the balance being deposited into the mains and drips within a short time. Therefore it would seem advisable when considering buying or building fogging apparatus to secure or make that type which will be the most efficient from the standpoint of the amount of oil vaporized or atomized and the amount of oil appearing as fog.

Fogging oils are chosen from among the lower viscosity petroleum oils having a much narrower boiling range and unusually higher viscosity than gas oil, being similar to some wash oils. Careful consideration of the requirements of a fogging oil have led to the conclusion that boiling range and stability in the case of an oil to be used in a hot fogger, and boiling range, stability and proper viscosity in the case of an oil for the atomizing type fogger are the principal

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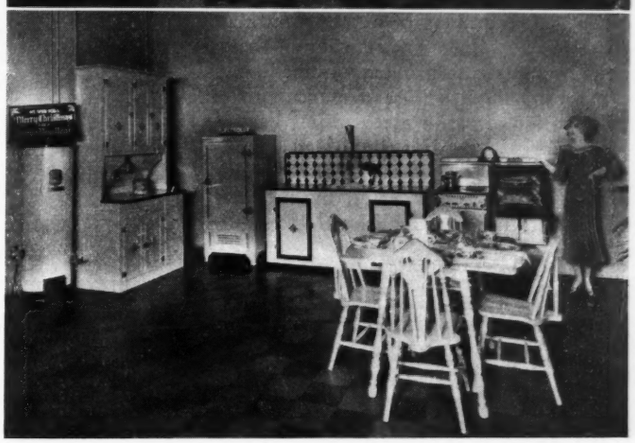
An Inter-Office Window *and* Floor Display Contest



Christmas in a modern home setting, featuring comforts and conveniences available through gas service, is pictured in the two views at the right which comprise the Santa Ana district office floor display entry in Southern Counties Gas Co.'s 1932 Christmas display contest. First prize in the district office class was awarded to Santa Ana.

By WALTER D. THURBER

Advertising Manager
Southern Counties Gas Company

CHRISTMAS window and floor displays, as created and produced entirely through the efforts of local employees in our 38 Southern California district and sub-district offices, have become a regular feature in the promotional program of Southern Counties Gas Co.

Employee interest in the building of successful displays is stimulated by a two-division contest in which prizes are awarded the employees who present the best Christmas picture from the standpoint of originality, customer-service, and the Christmas Spirit. A fixed maximum of expense is named for district office entries with a smaller maximum for sub-district offices. In many cases it has become a matter of pride with the local employee-group to offer a prize-winning entry at considerably less than the maximum of expense allowed.

W. D. Thurber

Our recent display-contest for 1932 was, in many respects, the most successful of any of these annual events. A total of 25 sub-district offices in addition to the eight district offices competed for the two cash prizes and the honorable mention award set up for each group.

A maximum appropriation of $25 for the expense of each district office display and $12.50 for the display in each sub-district office was provided. Rule Number Six in the series of seven simple regulations governing the contest will convey the general idea:

Rule 6: Entries will be judged and scored on the following basis:

(a) The Spirit of Christmas. The value of giving. The Christmas colors. General attractiveness and "eye-appeal" of the display. (Maximum of 20 points).

(b) Attractive portrayal of the *Service* which the user of the appliance or appliances will receive through the use of this modern equipment in the home. (Maximum of 35 points).

(c) Presentation of the selling qualities in the appliance or appliances shown. Selling appeal, etc. (Maximum of 25 points).

(d) Originality of the idea. (Maximum of 20 points).

Other rules provided that the display should be completed by December 5, that the entries should be made by a certain date prior to December 5, etc. Permission was given to make use of refurbished old display material and emphasis was given to the fact that the Committee of Judges would make awards strictly on the basis of "Rule 6."

Photographs of the first-prize awards to district and sub-district offices accompany this article. Naturally, it is impossible to bring out in photographic reproduction, all of the features contributing to the effectiveness of the displays. For instance, in the photograph of the modern natural gas range shown in the prize display at Santa Ana, one does not see the pan of nicely browned biscuits nor the appetizing and very real pie shown in the open oven. Neither can one see the realistic but imitation steam arising from the pan full of dishes in the kitchen sink as "hot" water appears to flow continuously from the mysterious faucet with no pipe connection anywhere. Nor can one see the gayly colored costume on the wife who is dressed for calling while her time-clock controlled oven takes care of the cooking job for her. Again the cheery glow from the actual gas fire in the living room part of the picture is not apparent in the photo.

In the picture of the uniquely attractive display at the Orange sub-district office, winner of the first prize in its division, one can not see the flame from the crude whale oil lamp in the Eskimo village "igloo" nor the colors in the contrasting picture presented by an authentic reproduction of "Valencia Rancho" with its modern natural gas equipment.

One might think that the room for originality in Christmas displays is somewhat limited, but after four years of these contests we have found no dearth of new ideas nor any lack of new and

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The Servicing *and* Adjustment *of* House Heating Equipment

By E. M. KENNEDY

Superintendent Service Department
Iowa-Nebraska Light and Power Company
*Lincoln, Nebraska**

IN THE month of October, 1930, natural gas was turned into the distribution system of Lincoln, Nebraska. It is a far cry from that date until now, insofar as experience is concerned. Here was a new product to contend with, and with its coming many new and intricate problems immediately confronted those utilities engaged in the distribution of gas in the Middle West—particularly the adjusting of gas appliances, then in existence, and the building up of the load through the medium of the installation of additional gas appliances.

In our company, the sales department was enlarged by engaging salesmen with previous sales experience in house heating. A house heating department was set up, with an experienced engineer in charge who was assigned by others employed for surveying and checking houses.

Specifications were drawn up covering the installation of heating equipment by the engineering department, which were passed on to the service department for their guidance.

The successful and satisfactory servicing and adjusting of home heating equipment depends a great deal upon the personnel of the service department. In the building of a department such as this the fundamentals of good organization must be observed, and efficient supervision must be provided.

Only the keenest attention by the employee to the company's interests, inspired by a sense of personal responsibility for the success of the business, will enable the company to attain the high degree of efficiency which is necessary for it to render the best possible service. It is, therefore, very essential in choosing employees for the servicing and adjustment of some heating equipment that the foregoing facts be kept in mind.

One of the first things of importance in successful servicing of house heating equipment starts at the time of the sale. Some salesmen in their enthusiasm to sell a burner or a furnace make the mistake of telling the customer to let the company install the equipment and after it is installed to forget it, to pay no more attention to the heating plant. This is wrong. It is true in a large number of cases that no great amount of attention is needed, yet experience shows it is well to have the customer look at his heating equipment at least two or three times weekly. There are at times some little things that need attention; taking care of them immediately may prevent more serious trouble later on. For example, a smoke pipe may become loosened, the humidifier may be dry, the motor valve may be noisy, and other things may need attention. No one would think of letting the motor of his automobile go on indefinitely without looking at it occasionally, or having it checked over periodically.

Practically all heating equipment sold is manufactured so that mechanically, at least, it will operate nearly 100 per cent correct if properly installed. This is, without question, the first and most important step to successful servicing of home heating equipment—proper installation. It is the practice in our company for the service department to follow very closely the specifications for the installation of burners and furnaces as prepared by the house heating department. This is done because of the fact that when the order reaches the service department we know the proper preliminaries have been taken care of such as the designation of the proper size of burner or furnace for that particular job. In the case of a conversion burner an inspection is then made of the furnace to determine if the fire bowl, fire rings, soot box, feed pouch or radiator is cracked.

If any cracks are found our company does not install the burner until the proper repairs are made. After repairs are made or if the furnace is found to be in good condition, and 80 per cent of them are, it is then thoroughly cleaned of old scale, soot and ashes, before installing a conversion burner. We install a clean-out door in the chimney if one is not already in place, and make sure that the chimney is thoroughly cleaned out. This is very important. A stopped-up chimney can cause some very disastrous results. Either a down draft diverter or an open tee is installed in smoke pipe leading to the chimney. Governor and meter sizes are taken care of in the specifications, as is the proper size of fuel run.

Those who are responsible for installations will do well to caution the fitters about building the fuel run so that only the least number of fittings will be used. This cuts down the places for gas leaks as well as allowing a better flow of

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* Presented before the 12th Annual Gas Meter School and Conference, Iowa State College, Ames, Iowa, in co-operation with Mid-West Gas Assn., December 6-9, 1932.

GAS FURNACE INSTRUCTIONS

Important Items for Attention Before Starting Gas Furnace

Do Not Proceed with these Instructions if there is Smell of Gas in Basement—Call the Gas Company
BE SURE to remove from clean out at base of chimney old soot which drops down after gas furnace is used, also bird nests, bricks and any other foreign matter which frequently accumulate in chimney. **Furnace smoke pipe rusts out readily** and should be replaced if rusted through. These items are very essential to proper draft for **SAFE** and **EFFICIENT** operation of your gas furnace

All Valves and Switches in the following instructions are identified by tags.

TO START FURNACE

ELECTRIC SWITCH must be **OFF.**
MAIN GAS VALVE must be **CLOSED.**
PILOT VALVE must be **CLOSED.**
THEN PROCEED AS FOLLOWS:

CLOSE Electric Switch for **10** seconds then **OPEN IT.**
OPEN furnace door for at least **10** MINUTES for airing.
OPEN MAIN GAS VALVE. Use long taper to light pilot.
Place lighted end of taper on pilot, then **OPEN** PILOT VALVE.

(On Robert-Gordon burners, front radiant must be removed to permit lighting of pilot. Replace radiant after lighting pilot.) **Permit pilot to burn 5 or 10 minutes, then proceed with next instruction.**

CLOSE ELECTRIC SWITCH. If room temperature is less than thermostat setting, furnace burner should light.

TO RELIGHT PILOT

If pilot light goes out during heating season, proceed as follows:
OPEN ELECTRIC SWITCH.
CLOSE MAIN GAS VALVE.
CLOSE PILOT VALVE. Then proceed with instructions under "TO START FURNACE"

TO SHUT DOWN FURNACE

OPEN ELECTRIC SWITCH.
CLOSE MAIN GAS VALVE.
CLOSE PILOT VALVE.

NOTE

Oil motor valve at least 3 times during heating season with Finol or other good grade sewing machine oil. Inspect heating plant periodically. Do not burn papers or garbage in furnace. If customer does not wish to turn on or turn off furnace call

IOWA-NEBRASKA LIGHT & POWER CO.
Nite Phone.....
Day Phone.....

The above instruction card was placed on each furnace to be installed. Tags were also wired on each valve and on the switch-box.

Gas industry rally and banquet in progress at Larkin Hall, Civic Auditorium, San Francisco, December 14.

1933 Sales Offensive Opened *in* Northern California Area

HISTORY was made in San Francisco during the four days beginning with December 13. Packed into these vital four days were the Home Appliance Exposition, the annual dinners of the gas and electric industries of Northern California, a sales convention of Pacific Gas and Electric employees, and the Fall organization conference of the Pacific Coast Gas Association.

Back of it all was the courageous and inspired leadership of the management and sales executives of the Pacific Gas and Electric Co. " 'Why doesn't somebody do something?', has been the question on everyone's lips for the past three years," said one speaker. Here was an example of a great industry with the vision to plan and the courage to initiate a program of sales activity which will maintain its business, increase employment and at the same time render a necessary service to the public.

Home Appliance Exposition

In the four days some 25,000 persons viewed the beautifully decorated and effective display of domestic gas and electric appliances in San Francisco's Civic Auditorium. The decorations featured the Christmas spirit with illuminated poinsettias, and holly, and above the stage the three wise men mounted on camels were intent on following the Star of Bethlehem. The display of gas appliances included all the leading makes of gas ranges, water heaters, boilers, furnaces, circulators and radiant heaters. The arrangement was unique in that all appliances of the same type were placed together, thus eliminating the customary individual manufacturer's booth.

Gas Industry Meeting

The Gas Industry Rally and banquet took place on Wednesday evening, December 14. It was sponsored jointly by the Pacific Coast Gas Association and the Gas Appliance Society of California, and was attended by 350 dealers, manufacturers and utility men. Guests included the officers of important allied trade associations such as the master plumbers, the furniture association, the retail merchants, the dry goods association, and the hardware association.

R. E. Fisher, vice-president in charge of public relations and sales, Pacific Gas and Electric Co., acted as chairman and first introduced Geo. P. Egleston, vice-president of the Gas Appliance Society of California, who delivered a message from O. C. Bunster, the Society's president. Mr. Bunster paid a tribute to the effective way all branches of the gas industry had worked together through the medium of the Gas Appliance Society, calling particular attention to the successful cooperative sales and advertising campaigns conducted by the Society during 1932. He ascribed the success of the Society to the fact that it is essentially a sales organization and wastes no energy in internal organization matters. He condemned the present tendency toward extreme price appeal saying that in most cases it occasioned sacrifices in quality of merchandise and led directly to lower profits and loss of reputation.

Harry L. Masser, president of the Pacific Coast Gas Association, made a dramatic appeal for more aggressive salesmanship by all branches of the industry. He pledged the utmost in cooperation in behalf of Pacific Coast gas companies, stating that all of them recognize the manufacturers of gas appliances and the retail dealers who sell and install them as their partners in the gas business.

Carl Swigart, trade relations representative of the Pacific Coast Gas Association and the Pacific Coast Electrical

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Pacific Coast Gas Association

Managing Director: Clifford Johnstone
Association Headquarters:
447 Sutter Street, San Francisco

President: H. L. Masser
Vice-President and Executive Engineer,
Los Angeles Gas and Electric Corp.

Sections Report on 1933 Objectives

GENERAL chairmen of the Association's several Sections have supplied progress reports and statements of the objectives toward which their committee organizations are working this year, as published below. It will be seen from the well laid program of each Section that another fruitful year of activity is under way.

Accounting . . .

A MEETING of the Accounting Section of the Pacific Coast Gas Association was held December 14, 1932. Considerable time was spent in discussion of various accounting papers to be presented at the annual convention next

After careful consideration it was the concensus of opinion that we should limit ourselves to a few vital subjects and allow adequate time for a thorough discussion of each. Consequently, it was decided to have papers prepared on the following:

Fixed Capital Records.

Preparation of Financial Reports.

Stores Accounting Procedure.

Accounting Control of Collections and Meter Deposits.

In connection with the Fixed Capital Records paper it was the unanimous opinion that we should have Mr. S. W. Binckley continue the fine work accomplished last year.

A paper outlining the procedure followed by one of the large companies in the preparation of its monthly financial reports will be presented. Immediately after the presentation of this paper it is planned to allow considerable time for discussion of the various methods followed by the member companies. The purpose of this discussion will be to develop methods tending to quicker and more economical preparation of financial reports.

It is planned to have a committee on Stores Accounting Procedure with the thought in mind to develop a system of handling stores records with the minimum of cost and time, and maximum of efficiency. The committee on Stores Accounting Procedure will study systems in various member companies and make its report, setting forth a system which in its opinion will best accomplish the above mentioned purpose.

A paper will be presented on Accounting Control of Collections and Meter Deposits. This paper will set forth the manner in which such control is now obtained by one of the member companies. After the paper is read sufficient time will be taken for a thorough discussion of this very important subject.

Tentatively it is planned to have an exhibit of various accounting machines and systems at the convention in August, although the exact details in connection with the same have not as yet been decided upon.

R. N. DREIMAN,
General Chairman,
Accounting Section

Commercial . . .

THE Association's Commercial Section has for its objective during 1933 the continued development of a number of studies carried over from last year and the inauguration of a limited number of new topics, the solution of which would, it is believed, be of considerable value to the industry. The work will be carried on through two main committees: The Domestic Sales Committee, headed by H. E. Davidson, superintendent of appliance sales, Southern California Gas Co., and the Industrial Sales Committee, headed by K. B. Anderson, manager of the Coast Industrial Gas Co.

Clyde H. Potter of the Southern Counties Gas Co., has accepted the chairmanship of the Program Committee to arrange for the features of the spring conclave of the Commercial Section to be held in Los Angeles.

Domestic Sales

Among the studies to be continued is that on determining the load value of individual appliances and groups of appliances. Harry Warren of Southern California Gas Co. will continue as chairman of the Air Conditioning Committee. The committee on Analysis of Market Surveys will also be continued and will have available to it a complete survey of the City of San Diego. The Architects and Builders Manual (Data Book on Gas Fuel) published in 1931, will be kept up to date and ready for reprinting at any time by the same committee which prepared it originally, headed by Frank Moon, Los Angeles Gas and Electric Corp.

New studies will include an analysis of the agricultural load available to gas, this study being conducted by C. M. Grow, Southern California Gas Co. A study will also be made of the value to the industry of talking motion pictures, not only for training salesmen but also as a promotional activity in illustrating the many services gas can render to the public. Other problems which will be studied, but which may not lead to formal reports, include a comparative analysis of existing gas appliance ordinances, a detailed study of the trends and economics of domestic cooking, and a survey of the equipment used in the domestic science departments of schools. W. F. Neiman of the Pacific Gas and Electric Co. is the chairman of the committee which is to present a review of city ordinances that are now in effect on the Pacific Coast. This review will include a digest of the important features embodied in outstanding ordinances in the more important centers of the coast.

Industrial Sales

Mr. Anderson has planned a very practical program. A study will be

made of the various methods now in use of financing large industrial conversion installations. Interest in the feasibility of orchard heating has been revived in certain localities due largely to the availability of improved equipment. The practicability of this load will be studied. An effort will be made to evaluate the many so-called intangible advantages gas fuel has over its competitors. This study will be made by R. L. Grutzmacher of Natural Gas Equipment, Inc. The committee will continue the issuance of Industrial Data Sheets, the study of competition, and the use of gas in restaurants.

At the Organization Conference in December, the Industrial Sales Committee presented a paper by J. F. Aicher on Automatic Controls which was published in December *Western Gas*. The committee also met with representatives of the Technical Section for a discussion of Frank Wills' paper on Chimney Design and a discussion on the servicing of industrial installations. This latter discussion will be used as the basis for a paper by M. A. Richford, Pacific Gas and Electric Co., to be presented at a later meeting this year. The Domestic Sales Committee presented a paper at the Conference by W. M. Couzens, American Gas Association Laboratory, on the character of gas furnace installations. At the request of the committee, Walter M. Berry, Consulting Engineer, is preparing a paper on Gas Appliance Design which will be presented at the 1933 Convention.

The Commercial Section proposes the formation of a joint committee to work with the Technical Section to make a study of the performance characteristics of the various makes and types of regulators and control valves that are used on commercial and industrial installations. The results of these studies are to be made available to the industry in the form of data sheets and will constitute a valuable aid in the proper sizing and equipping of gas installations with proper and adequate gas regulating and control devices.

F. U. NAYLOR,
General Chairman,
Commercial Section.

Public Relations . . .

THE Executive Committee of the Public Relations Section met at San Francisco, Wednesday morning, December 14, and effected partial organization for the year's work. The following Committee Chairmen assignments were made:

D. L. Scott

Customer Ownership Committee: E. J. Beckett, chairman, assistant treasurer of Pacific Gas and Electric Co.

Mr. Beckett is being asked to continue this work for the second year. The statistical work of this Committe especially is considered valuable and important to keep up to date.

Customer Relations Committee: O. L. Moore, chairman, manager customers department, Los Angeles Gas and Electric Corp.

This Committee is working in unity with the corresponding Committee in the Pacific Coast Electrical Association. It is the purpose to hold three Customer Relations Conferences during the year—one at San Francisco, one at Los Angeles, and one in the Northwest. The San Francisco conference was held Wednesday afternoon, December 14.

Employee Welfare Committee: Eugene G. McCann, chairman, personnel director, Pacific Gas and Electric Co.

This is a repeat appointment. Mr. McCann will complete the work undertaken last year.

Women's Committee: Mrs. Jeanette I. Rees, chairman, Southern California Edison Co.

This Committee and the Women's Committee of the Pacific Coast Electrical Association operate as one organization. Their work proceeds on a year-round schedule, uninterrupted by conventions or changes in Administration. Needless to say, the Committee is doing the very best of work.

Speaking Contest Director: W. A. Worthington, chairman, assistant engineer, Pacific Gas and Electric Co.

The subject for the speaking contest this year will be "The Public Utility's Relation to Social Progress." Speeches will be five minutes in length. The plan of preparation of the speeches is different from any which we have used in the past. Contestants will study the general subject. At the Convention, the Contest Director will assign a different phase of the subject to each contestant, five or six hours in advance of the actual time of the contest. Contestants will then organize their outlines and speak extemporaneously.

This plan was adopted with the very definite purpose of avoiding the memorizing of set speeches, and placing the contest upon a basis reflecting speaking ability rather than the ability to memorize.

The women's speaking contest as usual will be under the direction of the Women's Committee.

Essay Contest Director and Stunts Contest Director, and the subjects for these contestants, will be announced in the near future.

D. L. SCOTT
General Chairman,
Public Relations Section

Publicity and Advertising . . .

THE Publicity and Advertising Section will carry on its work this year, prior to the Annual Convention, through four Committees and three meetings.

The Committees are those of Exhibits, under the chairmanship of A. C. Joy, Pacific Gas and Electric Co.; Direct Load Building Advertising, headed by Douglas Buckler, Southern California Gas Co.; Set of Standards, with Walter D. Thurber, Southern Counties Gas Co., chairman; and Dealers and Manufacturers Cooperation, headed by J. Charles Jordan, Pacific Gas and Electric Co.

Eugene P. Ramsay

The three section meetings, prior to the Convention, will be joint ones with the Advertising-Publicity Section of the Pacific Coast Electrical Association, whose chairman is Forrest M. Raymond, San Diego Consolidated Gas & Electric Co. It is felt that, inasmuch as the membership of the two sections is very largely the same, and the problems of advertising and publicity identical for all utilities, considerable time and expense will be saved at this time by holding combination meetings of the two groups. One such meeting has already been held—in San Diego, October 19. The two others will be in San Francisco and Los Angeles. At these meetings current business of each section is disposed of separately, and joint sessions discuss and hear discussed topics of live and practical interest to utility advertising and publicity men.

The most ambitious individual item on this year's Section program is the gathering and coordinating of data on

the coast companies' advertising expenditures, practices, standards, media, etc. It is the intention, as a result of this work, to issue a handbook of gas company advertising, which will be valuable to both advertising and commercial men.

EUGENE P. RAMSAY,
Acting General Chairman
Publicity and Advertising Section

Technical . . .

ORGANIZATION of the Technical Section is now practically complete, the various committees have outlined their programs, work is actively under way, and everything points to a very successful and valuable Association year. The general organization scheme remains the same as in former years, with the committees divided into the three main sub-divisions of Distribution, Natural Gas Transmission, and Production. Sub-committees are formed under these three main divisions, and in some instances the sub-committees have themselves been further divided—the purpose being to spread the work as much and as definitely as possible and to encourage individual responsibility.

Guy Corfield

Policies: As far as possible the program has been outlined to attack those subjects which are of greatest interest and importance to the industry and upon which definite and authentic information can be obtained. Quality will be sought rather than quantity, through a relatively small number of committees, with a wide personnel distribution. As a means of establishing a code of quality, it is proposed to form a Publications Committee which will judge all committee reports and decide whether they merit publication in the Association Proceedings, or whether they should be continued for one or more years longer, to complete or round out the information before publication. If any reports are completed in time they will be submitted at the proposed Regional Conferences at Los Angeles in March, and in the Northwest in June. It is also proposed to limit the reports presented and discussed at the Annual Convention to the few that will be the most valuable and interesting and permit of ample time for discussion. This selection may also be made by the Publications Committee.

The personnel and program of the various committees are as follows:

DISTRIBUTION COMMITTEE

F. A. Hough, Southern Counties Gas Co., Chairman

Pipe Protection Sub-Committee

Personnel:

O. L. Wrestler, Los Angeles Gas and Electric Corp., Chairman.
C. P. DeJonge, San Diego Consolidated Gas and Electric Co.
Chris Goldkamp, San Diego Consolidated Gas & Electric Co.
A. B. Allyne, Southern Counties Gas Co.
H. J. Keeling, Southern Counties Gas Co.
D. A. Hiskey, Southern California Gas Co.
M. T. Burton, Southern California Gas Co.
L. L. Biggs, Southern California Gas Co.
R. C. Terradell, Los Angeles Gas and Electric Corp.
B. A. Williamson, Los Angeles Gas and Electric Corp.
Clark Taylor, Los Angeles Gas and Electric Corp.
W. R. Schneider, Pacific Gas and Electric Co.
A. E. Englebright, Pacific Gas and Electric Co.

Program:

1. Soil Survey Indications vs. Actual Rate of Pitting.
2. Ground Moisture—Seasonal Variation.
3. Pipe Coating Materials for Special Uses.
4. Cathodic Protection.
5. Electrolysis Mitigation Practices.

Distribution Design Sub-Committee

Personnel:

N. L. Hoff, Los Angeles Gas and Electric Corp., Chairman
A. B. Myers, Southern California Gas Co.
S. W. Binckley, Southern California Gas Co.
Don C. Murphy, Southern California Gas Co.
L. O. Howell, Los Angeles Gas and Electric Corp.
R. U. Fitting, Los Angeles Gas and Electric Corp.
C. P. De Jonge, San Diego Consolidated Gas & Electric Co.

Program:

1. Demand meter studies to test the validity of equations and methods presented in former reports on load factors and diversity of consumer load by individuals and groups.
2. Solution by geographical means of network flow problems.
3. Problems in economics of gas distribution.

Distribution Pressure Control Sub-Committee

Personnel:

H. S. Harris, Los Angeles Gas and Electric Corp., Chairman.
A. R. Bailey, Coast Counties Gas & Electric Co.
W. E. Gentner, Southern Counties Gas Co.
W. L. McKee, Southern Counties Gas Co.
H. J. Keeling, Southern Counties Gas Co.
Otto Goldkamp, San Diego Consolidated Gas and Electric Co.
H. M. Goodro, Southern California Gas Co.
V. W. Harper, Portland Gas & Coke Co.
C. Ray, Los Angeles Gas and Electric Corp.
W. A. La Violette, Pacific Gas and Electric

Program:

1. Effect of pressure on leakage:
   (a) Review of data already available.
   (b) Additional tests if available data not conclusive.
2. Estimates of monetary losses resulting from the carrying of excessive pressures on typical high pressure distribution systems.
3. Methods and cost of pressure control on high pressure systems.
4. Minimum pressures permissible on high-pressure distribution systems as fixed by:
   (a) House type regulators.
   (b) Service pipe and fittings.
   (c) Industrial appliances.
5. Advantages, if any, and reasons for varying pressures on low-pressure distribution systems.
6. Methods and cost of pressure control on low pressure systems.
7. Limits to permissible range of pressures on low pressure systems fixed by:
   (a) Service pipe and fittings.
   (b) House lines.
   (c) Appliance operation.
   (d) Safety.

Safe Gas Distribution Practice Sub-Committee

Personnel:

C. A. Renz, Los Angeles Gas and Electric Corp., Chairman.
H. M. Goodro, Southern California Gas Co.
J. B. Wright, Southern Counties Gas Co.
W. L. McKee, Southern Counties Gas Co.
R. A. Hoffman, Spokane Gas & Fuel Co.
N. K. Senatoroff, Los Angeles Gas and Electric Corp.
Allen Larry, Los Angeles Gas and Electric Corp.
W. A. Bahr, Pacific Gas and Electric Co.
E. T. Floyd, Pacific Gas and Electric Co.
C. P. De Jonge, San Diego Consolidated Gas and Electric Co.

Program:

1. Routine Safety Methods.
   (a) Manhole and vault surveys for explosive mixtures.
   (b) Surveys for leakage in basements in business districts.
   (c) Leakage surveys in streets.
2. Method for establishing responsibility for damage occurring from:
   (a) Explosions.
   (b) Damage to vegetation on account of leakage or construction.
   (c) Open excavations.
   (d) Improperly filled excavations.
   (e) Improperly placed danger signs and barricades.
3. Hazardous Structures.
   (a) Gas lines and risers under buildings.
   (b) Live abandoned services in private property.
4. Safety devices and methods.
   (a) Pressure relief valves on low pressure distribution systems.
   (b) Automatic gas shut-offs actuated by fire.
   (c) Curb cocks or valves.
   (d) Check valves or protective equipment on lines to blow torches using oxygen under pressure.
   (e) Pressure relief valve, control of fuel or combination of both, on water heaters.
   (f) Underground vaults, ventilating system.
   (g) Barricades.
   (h) Tapping mains and services for extensions and connecting services.
   (i) Changing stopcocks under pressure.
   (j) Blowing mains and services free of rust.

Appliance Servicing Sub-Committee

Personnel:

H. W. Geyer, Southern Counties Gas Co., Chairman.
George Porter, Southern California Gas Co.
(Other members being contacted).

Program:

1. Review of data already available, including report of last year's committee.
2. Service personnel training schools and methods used by several companies.
3. Analysis of relative cost of different appliance servicing policies.
4. Organization and routine for handling service work in:
   (a) Company serving a congested district.
   (b) Company serving widely scattered, small communities.
5. Problems in servicing appliances, particularly the latest automatic types which were not covered in previous reports.

Governors and Regulators Sub-Committee

Personnel:

W. A. La Violette, Pacific Gas ad Electric Co., Chairman.
(Members being contacted).

Program:

1. Regulator performance at low pressures.
2. Effective area of regulator diaphragms.
3. Capacities of various regulatory devices, controls, pipe fittings, etc.

Cast Iron Pipe Service Connections Sub-Committee

Personnel:

W. E. Gentner, Southern Counties Gas Co., Chairman.
(Members being contacted).

Program:

Description, examination, testing and design of methods and devices for making service connections to:
   (a) New cast iron pipe.
   (b) Old cast iron pipe that has wall thickness reduced and weakened by corrosion and graphitization.

NATURAL GAS TRANSMISSION COMMITTEE

B. M. Laulhere, Southern California Gas Co., Chairman.

Transmission Pipe Line Sub-Committee

Personnel:

R. L. Cook, Southern California Gas Co., Chairman.
A. B. Allyne, Southern Counties Gas Co.
Earl Jinnett, Southern Counties Gas Co.
Carl Summers, Southern Counties Gas Co.
P. E. Beckman, Pacific Gas and Electric Co.
F. E. Wilson, Pacific Gas and Electric Co.
M. T. Burton, Southern California Gas Co.
C. E. Pickup, Southern California Gas Co.
Wm. Pipkin, Southern Fuel Company.
H. S. Harris, Los Angeles Gas and Electric Corp.

Program:

1. Internal Corrosion of Pipe Lines.
2. Expansion and Contraction of Pipe Lines.
3. Recent Developments in Welding.

Compressor Stations Sub-Committee

Personnel:

C. S. Pool, Industrial Fuel Supply Co., Chairman.
P. E. Beckman, Pacific Gas and Electric Co.
Leal Davis, Pacific Gas and Electric Co.
W. K. Dodd, Southern California Gas Co.
B. E. Embry, Southern California Gas Co.
E. L. Ford, Industrial Fuel Supply Co.
T. C. Wallace, Southern Counties Gas Co.

Program:

(1) Effect of Gas Engine Piston Design Upon Heat Dissipation.
(2) Efficiency of Air Filters for Gas Engines.
(3) Use of Metal Spray on Compressor Piping.

Gas Measurement Sub-Committee

Personnel:

L. F. Reetz, Pacific Gas and Electric Co., Chairman.
P. E. Beckman, Pacific Gas and Electric Co.
E. C. Johnson, Pacific Gas and Electric Co.
R. M. Stewart, Pacific Gas and Electric Co.
L. Wollenberger, Coast Counties Gas and Electric Co.
Mr. Fisher, Coast Natural Gas Co.
L. P. W. Des Brisay, Los Angeles Gas and Electric Corp.
C. E. Pickup, Southern California Gas Co.

Program:

1. Critical flow of orifices.
2. Gas temperature measurement.
3. New types of flow meters and recording devices.

PRODUCTION COMMITTEE

C. P. Johnson, Puget Sound Power & Light Co., Chairman.

Chemical Laboratory Methods Sub-Committee

Personnel:

J. M. North, Los Angeles Gas and Electric Corp., Chairman.
N. K. Senatoroff, Los Angeles Gas and Electric Corp.
C. E. White, San Diego Consolidated Gas and Electric Co.
A. B. Allyne, Southern Counties Gas Co.
M. T. Burton, Southern California Gas Co.
F. C. Jones, Pacific Gas and Electric Co.
C. S. Smith, Pacific Gas and Electric Co.
S. C. Schwarz, Portland Gas & Coke Co.
J. T. Roberts, Spokane Gas & Fuel Co.
Mathew Brown, B. C. Electric Railway Co., Ltd.

Program:

1. Microscopic Qualitative Analysis.
2. Gas Analysis apparatus design.
3. Gas Analysis procedures, with particular reference to natural gas.
4. Methods of pipe deposit analysis.
5. Determination of carbon dissulphide in manufactured gas.
6. Determination of small quantities of oxygen, sulphur, propane and butane in natural gas.
7. Determination of small amounts of combustibles in unknown gas samples.
8. Water analysis procedure.

Gas Holder Maintenance Sub-Committee

Personnel:

T. N. Kellett, Los Angeles Gas and Electric Corp., Chairman.
C. W. Beck, Los Angeles Gas and Electric Corp.
M. J. Cereghino, Los Angeles Gas and Electric Corp.
O. L. Wrestler, Los Angeles Gas and Electric Corp.
H. M. Thomas, Northwest Cities Gas Co.
F. C. Hawks, Washington Gas & Electric Co.
W. H. Cohick, Pacific Gas and Electric Co.
W. E. Bradford, Northwest Cities Gas Co.

Program:

1. Comparative costs of maintenance and operation of waterless gas storage holders at various locations.
2. Making repairs to water sealed gas holders:
   (a) While in operation.
   (b) After settling of foundations.
   (c) With structural work out of alignment.
   (d) When lifts interfere with each other.
3. Use of non-drying oils and paints.

Coal Gas Sub-Committee

Personnel:

John Keillor, B. C. Electric Power & Gas Co., Chairman.
(Members being contacted).

Program:

1. Detailed report and description of new Chamber-Oven plant at Vancouver, B. C.
2. Developments in coal gas plant procedure in Northwest.

Tar Burning Sub-Committee

Personnel:

W. H. Wattenberger, Washington Gas & Electric Co., Chairman.
H. M. Thomas, Northwest Cities Gas Co.
F. C. Hawks, Washington Gas & Electric Co.
R. S. Hickox, Puget Sound Power & Light Co.

Program:

Study of methods for sale or plant utilization of by-product tar.

Operating Problems Sub-Committee

Chairman not yet selected.

Program:

To collect short descriptions of minor apparatus and operations designed to facilitate work around the plants—with particular reference to the coal gas plants of the Northwest.

Natural Gas Prospects in Washington and Oregon Sub-Committee

Chairman not yet selected.

Program:

To bring up to date the information available on Natural gas prospects in Washington and Oregon.

GUY CORFIELD,

General Chairman, Technical Section.

W. S. Dole Donates Books

THE Association is indebted to Mr. W. S. Dole, formerly gas engineer for the Federal Light and Traction Co., New York, for the filling out of its series of Brown's Directory. Mr. Dole has supplied the library with the issues of Brown's Directory for the years 1906, 1916, 1917, 1918 and 1919. This gives the Association practically a complete file of these historical volumes.

Mr. Dole has also supplied copies of the Proceedings of the Congress of Gas Associations of America held in 1904, and a copy of the Proceedings of the American Gas Light Association for 1906; also a copy of the Proceedings of the American Gas Institute for 1911.

Mr. Dole's generosity gives the Association one of the few complete sets of gas association proceedings in existence.

Seventh Mid-West Gas Sales Conference

THE Seventh Mid-West Regional Gas Sales Conference of the Commercial Section, American Gas Association, will be held at the Sherman Hotel Chicago, Ill., on February 14 and 15, 1933, according to J. W. West, Jr., secretary of the Commercial Section, A.G.A. These dates were decided upon at a meeting of the Mid-West Regional Gas Sales Council held at Chicago on December 9. Stanley Jenks, Northern Indiana Public Service Co., is chairman of the Council.

Plans for the sessions as now formulated include discussions of the following subjects: Surmounting Cooking Competition; Manufacturers National Gas Range Advertising Program; Cooperative Sales Possibilities for the Hardware Dealer; What Utility Cooperation Means to Steam Fitters; 1933 Sales Trends from the Manufacturers Viewpoint,—including discussions on Refrigeration, Central House Heating, and Space Heating; Use of Manufacturers' Advertising Material; Water Heating Competition and Methods of Meeting It; and Selling Home Heating Today. There will also be round table discussions on paramount problems of sales promotion.

Speakers invited to address the Conference include F. M. Milward Oliver, Philadelphia Gas Works Co., Philadelphia, Pa.; B. T. Frank, American Light and Traction Co., Chicago, Ill.; Morse Del Plain, Northern Indiana Public Service Co., Hammond, Ind.; John A. Fry, Detroit-Michigan Stove Co., Detroit, Mich.; W. E. Derwent, Geo. D. Roper Corp., Rockford, Ill.; G. H. Schlatter, Electrolux Refrigerator Sales, Inc., Chicago, Ill.; Stanley Taber, Iowa-Nebraska Light & Power Co., Lincoln, Neb.; Louis Stein, Northern States Power Co., St. Paul, Minn.; C. V. Sorenson, Indiana Electric Corp., Indianapolis, Ind.; C. A. Nash, United Light & Power Engineering and Construction Co., Davenport, Iowa, and Jack Torbert, Wyandotte County Gas Co., Kansas City, Kan.

The Mid-West Regional Gas Sales Conference is being held in conjunction with a meeting of the Great Lakes Division of the National Electric Light Association, which will convene on February 16-17. A joint meeting of the two groups will probably take place at the Edgewater Beach Hotel on February 15, at which time a program on cooperative sales activities will be presented.

The question of manufacturers' exhibits was brought up at the December 9 session of the Council, and it was decided that no formal exhibits should be arranged, but that manufacturers should be invited to attend and participate in the conference.

It was suggested at this meeting that companies represented in the Mid-West Regional Council should be invited to forward examples of their recent newspaper and direct mail advertising copy for mounting on panel boards to be placed on display at the Conference. This will be supplemented by advertising material from the exchange recently established by the A.G.A.

The Mid-West Regional Sales Conference is attended by members of the American Gas Association registered in the Commercial Section who reside in Illinois, Indiana, Missouri, Michigan, Iowa, Minnesota and Wisconsin.

The following are members of the Council: E. J. Boyer, sales manager, Minneapolis Gas Light Co., Minneapolis, Minn.; W. R. Evans, new business manager, Peoples Gas Light and Coke Co., Chicago; D. H. Frazer, Jr., Battle Creek Gas Co., Battle Creek, Mich.; W. L. Jones, sales manager, St. Louis County Gas Co., Webster Groves, Mo.; C. A. Luther, assistant manager, new business department, Peoples Gas Light and Coke Co., Chicago, Ill.; W. H. Miller, manager industrial gas sales, Public Service Co. of Northern Illinois, Chicago, Ill.; C. A. Nash, general sales manager, United Light & Power Engineering and Construction Co., Davenport, Iowa; A. F. Davey, division manager, Wisconsin Public Service Corp., Sheboygan, Wis.; Howard Davis, Consumers Power Co., Jackson, Mich.; R. O. Jasperson, new business manager, Milwaukee Gas Light Co., Milwaukee, Wis.; G. C. Klopf, commercial manager, North Continent Utilities Co., Chicago, Ill.; F. X. Mettenet, sales manager, Public Service Co. of Indiana, Indianapolis, Ind.; F. M. Rosenkrans, commercial manager, the Gas Service Co., Kansas City, Mo., and J. M. Curtin, manager, credit department. The Laclede Gas Light Co., St. Louis, Mo.

Wm. H. Barton, Montana Power Co. Executive, Passes December 26

WILLIAM H. BARTON, manager of the gas division of the Montana Power Co., Butte, Mont., died on December 26 from pneumonia, following an illness of a week. Mr. Barton's passing is regretted by a host of friends in the western industry, with which he was affiliated for over 25 years. He was an active member of the Pacific Coast Gas Association.

Wm. H. Barton

Mr. Barton was born in Lincoln, Neb., 43 years ago, moving to Oregon when a small boy. Following his schooling he accepted a position with the Portland Gas & Coke Co., serving with that organization for nearly 25 years. He left his post as manager of the customers' department of that company in June, 1931, to go to the Montana Power Co. at Butte, when that company was about to construct its Cut Bank to Butte natural gas transmission line.

Mr. Barton was also active in civic affairs in Portland, acting in an executive capacity with the Chamber of Commerce for about five years.

Funeral services were held in Butte on December 29 with interment at Portland, Ore. Mr. Barton is survived by a widow, a son and a daughter.

Indiana Gas Distribution Corp. Serving Several Indiana Towns

Natural gas was turned into the mains at Dana, Ind., early in December by the Indiana Gas Distribution Corp., organized recently to supply natural gas service to five or six small towns in Indiana. Franchises were obtained in Zionsville, Brownsburg, Carmel, Rockville, and Dana. The towns are all small, there being possibilities of slightly over 1,000 customers ultimately. At the present time approximately 300 customers have been connected to the distribution lines.

The supply of natural comes from the 20-inch line joining the Panhandle Eastern Pipe Line Co.'s main line from the Texas field. The Indiana Gas Transmission Corp. completed the Indiana extension, from Rockville to Muncie, where the line ties in with the main Columbia system in the state.

Plans for Establishing Municipal Gas System at Casper, Wyo.

The City of Casper, Wyo., on December 5 voted to submit a tentative operating contract with the Lakota Oil & Gas Co. of Minneapolis, Minn. The contract calls for a bond of $400,000 on the part of the Lakota company and will become effective on acceptance by that company and in the event that the City of Casper exercises its option to take over the distribution system now operated by the New York Oil Co. there.

The Lakota company would build a gas transmission line to supply the gas for the Casper municipal system.

Thomas J. Heard Named Sec'y., Arkansas Natural Gas Corp.

According to an announcement made late in December by D. W. Harris, vice-president and general manager of the Arkansas Natural Gas Corp., Shreveport, La., Thomas J. Heard has been named secretary of the organization, taking the place left vacant by the resignation of E. N. Watkins.

Mr. Heard began his utility career with the Fort Worth Gas Co., Fort Worth, Texas, as chief accountant. Later he held the position of accountant for the Lone Star Gas Co., Dallas. In 1914 he was elected to the position of secretary and treasurer of the Reserve Natural Gas Co. of Louisiana, Shreveport, La. In 1928 he was made general auditor of Arknatco, which position he held until his most recent promotion.

Leflore County Gas & Electric Has Increased Gas Supply

Leflore County Gas & Electric Co., Poteau, Okla., now has an adequate gas supply for winter use in its system, with the completion of a 16-mile, 6-inch spiral weld pipe line. The line connects the Red Oak gas field with the company's other lines at a point near the plant of the Lincoln Power Co. The construction of the line was necessary in order to carry the winter load, although it did not penetrate any new territory. Red Oak, Okla., was supplied with gas in 1931.

1933 Calendar

January

Northwest Oil and Gas Association—Annual Convention, Olympic Hotel, Seattle, Wash., Jan. 12, 13, and 14, 1933.

National Bottled Gas Association—Hotel Waldorf Astoria, New York, Jan. 23-24, 1933.

Compressed Gas Manufacturers Association—Annual Convention, Hotel Waldorf Astoria, New York, Jan. 23-24, 1933.

February

Commercial Section, American Gas Association—7th Mid-West Regional Gas Sales Conference, Hotel Sherman, Chicago, Ill., Feb. 14-15, 1933.

March

Oklahoma Utilities' Association—15th Annual Convention, Oklahoma City, March 7-8, 1933.

April

Missouri Association of Public Utilities—Elms Hotel, Excelsior Springs, Mo., April 27-29, 1933.

May

Southern Gas Association—25th Annual Convention, Washington, D. C., May 2,3,4, 1933.

Natural Gasoline Association of America—Annual Convention, Tulsa, Okla., May, 1933.

September

American Gas Association—15th Annual Convention, Chicago, Ill., week of Sept. 25, 1933.

October

American Petroleum Institute—14th Annual Meeting, Chicago, Ill., Oct. 24-26, 1933.

Reorganization of Middle West Utilities Co. Progressing

According to a statement issued on December 26 by Edward N. Hurley, receiver for the Insull interests of Chicago, reorganization and rehabilitation of the Middle West Utilities Co. is proceeding rapidly. Operating expenses of the company, according to Mr. Hurley, have been reduced $7,000,000, with further reductions in prospect. He states that practically all the bank loans to operating companies have been paid, and the individual utilities are operating at a profit. Middle West Utilities Co. is a holding organization built up by Samuel Insull to control approximately 50 operating companies in 21 states.

Merchandising Law Not Working Out

IN AN address November 18, 1932, before the Missouri Press Association at its annual convention in St. Louis, Mo., telling how the utility anti-merchandising law is working out in Kansas, John Redmond, editor of the Burlington, Kan., Daily Republican, former president of the Kansas Press Association, said in part:

"The merchandising law's real purpose, as stated by its supporters, was to take business from the utility companies and give it to the local merchants, but while it has taken business from the utilities, it has failed to help the average local merchants, partly because they are not equipped to go after it or to handle the service part of the business. And because they have not gone out after the business, chain stores and mail order houses which push their sales have profited.

"I am firmly convinced that the Kansas Utilities merchandising law is a bad thing for Kansas and that any law similar to it would be bad in any state and that the entire idea of the anti-merchandising law, like so many of the other experiments of government in business, is wrong in principle and serves no useful purpose."

The following resolution was adopted November 18, 1932, by the Missouri Press Association following Mr. Redmond's address:

"We express our appreciation and thanks to John Redmond, of Kansas, for his explanation of the Merchandising Law, to which the Missouri Press Association is unanimously opposed."

Franklin County Gas Co. Now Serving Ottawa Light Plant

The Franklin County Gas Co., Ottawa, Kan., has recently organized, with Chas. T. Judd, president and C. A. McComas, secretary-treasurer. In addition to Mr. Judd and Mr. McComas, the board of directors consists of Chas. T. Judd, N. E. Stucker, B. D. Bennett, John B. Davis.

The company began development of a field about one and a half miles west of Ottawa, Kan., during the summer months, and succeeded in getting gas production. A contract was signed with the City of Ottawa to supply the fuel for the city's electric light and water plant and one or two industries in Ottawa, and a line was constructed of 6-inch pipe, furnishing approximately 600,000 cubic feet of gas per day for the city plant.

The gas is brought in at about 750 feet with from 300- to 335-pound rock pressure.

Missouri Assn. of Public Utilities to Meet April 27-29 at Excelsior

The Missouri Association of Public Utilities will hold its 26th Annual Convention at Excelsior Springs, Mo., April 27, 28 and 29, 1933. Sessions will convene at the Elms Hotel. Program details are being worked out by a committee under the direction of C. J. Prashaw, general sales manager, Missouri Power & Light Co., Kansas City, Mo. Entertainment is in charge of a committee of which Paul C. Ford, Kansas City Gas Co., Kansas City, Mo., is chairman.

Vienna, Austria, May Have Natural From Fields Near the City

According to word received from the director of the municipal gas works at Vienna, Austria, a successful drilling program has been carried on by a private company in the environs of Vienna, and if the supply proves adequate for a city of the size of Vienna, which has a population of nearly 2,000,000, a transmission line will be constructed. Manufactured gas is already served there.

Rex Brown Named to Executive Position at Jackson, Miss.

REX I. BROWN, manager of the Little Rock division of the Arkansas Power & Light Co. on November 29 was named vice-president and general manager of the Mississippi Power & Light Co. at Jackson, Miss., taking the place left vacant by the resignation of L. V. Sutton, who has accepted an executive position with the Carolina Power & Light Co., Raleigh, S. C. W. H. Shurgar has been appointed to fill Mr. Brown's place with Arkansas Power & Light Co.

Rex I. Brown

Mr. Brown has had a background of general utility experience which fits him well for the position he now holds. From superintendent of the meter department of the Arkansas company, he went to the commercial department as manager, and in 1927 was made manager of the commercial and power sales department of the entire system. He served in this post until he was made assistant to the vice-president and manager of services in the Little Rock and Northwest divisions, and manager of the Little Rock Division, which position he held until his appointment with the Mississippi Power and Light Co.

T. M. Salisbury, assistant to Mr. Sutton, has been transferred to the Mississippi Power & Light Co. office at Brookhaven, Miss., where he will serve as division manager for the newly consolidated southern and southwestern divisions. The new division will be known as the Southern Division and will be divided into two districts, one under the supervision of G. C. Rawls, who will serve also as local manager at McComb, the other under R. S. Purser, of Brookhaven.

New Company Organized

Smith Natural Gas Corp., has been organized in Henderson, Kan., with capital stock listed at $100,000.

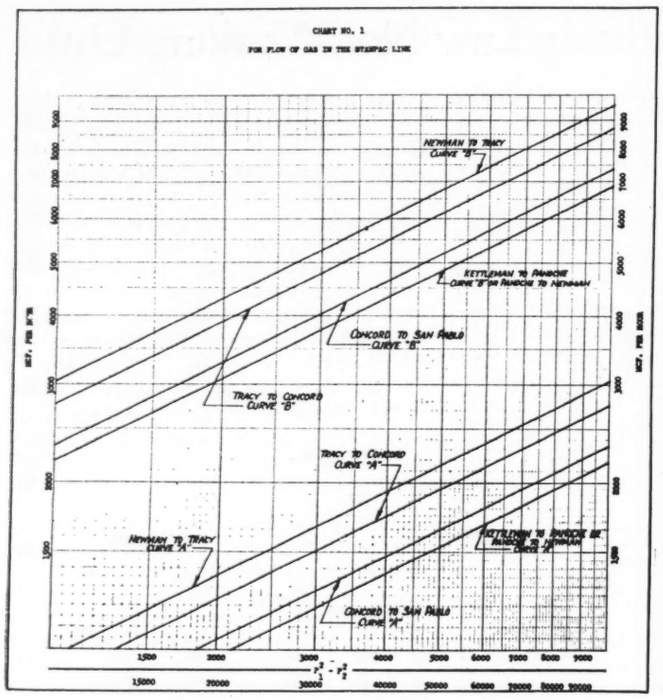


Fig. 3

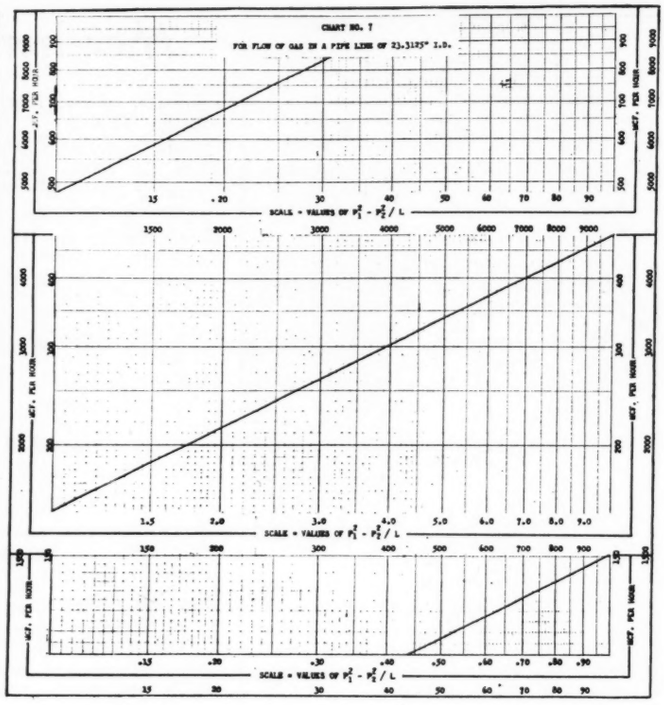


Fig. 4

Gas Dispatching in Northern California

(Continued from Page 9)

Francisco and Oakland of approximately 54,000,000 cubic feet. Without analysis, from this information it would seem we have sufficient storage capacity to take care of almost any error that might be made in the estimate. But this is not always true. First of all, we must keep sufficient gas in the storage holders at all times to take care of the load in these two cities for the maximum amount of time required for repairs in case of line breaks, blow-outs, wash-outs, etc. Second, the total system load each hour between 7:00 a.m. and 9:00 p.m. is greater than the average for the 24 hours by 13.5 per cent. Therefore, if the delivery from the source of supply were set at a rate per hour equal to the average hourly demand for the 24 hours, and the lines were operating at continuous flow straight through, it would be necessary to draw from the holders between 7:00 a.m. and 9:00 p.m. an amount equal to 13.5 per cent of the total demand for the day. But if the lines were packed, regulating at the terminals, it would be necessary to draw from them an amount equal to 13.5 per cent of the total day's demand, less the amount packed in the lines in excess of that necessary for continuous flow straight through at the rate of delivery from the field.

This factor of 13.5 per cent is based on the total system load (including the gas used by surplus gas customers, refineries, and electric plants), and is not indicative of the load factor for sections of the system separately. For example, the factor for San Francisco and Peninsula territory is 16 per cent, Oakland 14 per cent, Sacramento 20 per cent, and Stockton territory 16 per cent. Previous to the introduction of natural gas, this factor was approximately 24 per cent. The remarkable improvement since that time is due principally to the addition of the surplus gas, refinery, and electric plant loads.

During the winter months it is desirable as a safety factor to keep on hand in the holders at all times not less than 35,000,000 cubic feet. Although the transmission lines have a total capacity of approximately 200,000,000 cubic feet per day it would not be possible to take care of that much load, as it would mean drawing from the holders approximately 27,000,000 cubic feet, leaving on hand only 27,000,000 cubic feet by 9:00 p.m.

From these facts and for these reasons, it is highly important that the estimates be accurate.

Our gas load is composed of three major groups, namely, refinery, and steam heat and electric plant use. Surplus gas load (gas available to large customers) and firm load (consisting chiefly of service to domestic customers, but including also six other classifications).

The requirements for the electric plants are determined from reports received from the electric dispatcher's office as to the estimated kilowatt load to be carried at each individual plant, and the requirement for the oil refineries is determined and furnished by each refinery individually.

The surplus gas load does not change for corresponding days of each week, except by the addition of new customers and the seasonal or intermittent operations of others, nor

Sections	Miles Between Taps	Miles in Various Sizes I.D.					Equivalent in 21.375" I.D.					Total Miles 21.375	Accumulative Miles 21.375
		19.4375	21.375	23.3125	25.25	25.375	19.4375	21.375	23.3125	25.25	25.375		
Kettleman to Panoche	39.83		15.00	24.83				15.00	15.63			30.63	30.63
Panoche to Newman	64.55		9.31		55.24			9.01		22.85		31.86	62.49
Newman to Tracy	38.15				38.15					15.69		15.69	78.18
Tracy to Concord	35.16		4.30			26.86		8.30			10.76	19.06	97.24
Concord to San Pablo	20.26	9.51	10.65				15.79	10.85				26.64	123.88
Taps													
Mendota	20.85		15.00	5.85				15.00	3.68			18.68	18.68
Miller	32.72		9.01	18.98	4.73			9.01	11.95	1.95		22.91	41.59
Dos Palos	15.02				15.02					6.18		6.18	47.77
Los Banos	11.04				11.04					4.54		4.54	52.31
Newman	24.75				24.75					10.18		10.18	62.49
Patterson	10.98				10.98					4.52		4.52	67.01
Vernalis	13.75				13.75					5.65		5.65	72.66
Tracy Town	5.07				5.07					2.09		2.09	74.75
Tracy Terminal	8.35				8.35					3.43		3.43	78.18
Brentwood	13.63					13.63					5.46	5.46	83.64
Los Medanos Pump	12.00					12.00					4.81	4.81	88.45
Pittsburg	1.23					1.23					.49	.49	88.94
Stockton Brick	2.08		2.08					2.08				2.08	91.02
Shell Chemical	1.57		1.57					1.57				1.57	92.59
Nichols	2.54		2.54					2.54				2.54	95.13
Bay Point	2.11		2.11					2.11				2.11	97.24
Selby & Associated	1.60		1.60					1.60				1.60	98.84
Vine Hill	2.21		2.21					2.21				2.21	101.05
Shell Refinery	1.79		1.79					1.79				1.79	102.84
Crockett Junction	5.65		5.65					5.65				5.65	108.09
Hercules & Pinole	4.10	4.10					0.81					0.81	116.90
San Pablo Tank Farm	3.52	3.52					5.84					5.84	120.74
" " Terminal	1.89	1.89					3.14					3.14	123.88
Totals -	196.05	9.51	43.16	24.83	91.69	26.86	15.79	43.16	15.63	38.54	10.76	123.88	

TABLE NO. 1

Stanpac Line, showing the actual distances of various sections and between taps, and their equivalents in terms of 21.375-inch I.D. pipe.

is it affected by temperature change, excepting for a very small part of the load.

Estimating the requirements from day to day for the first two groups does not present a very difficult problem. The firm gas load does, however, present a difficult problem in that a portion of that load varies with the change in daily temperature and with the number of customers, which also varies during the changing seasons.

Our problem for determining this variable load was made more complicated by the fact that five separate load centers are served, each load center having widely varying daily temperature.

It can be seen that, for this type of load, the importance of temperature in each center would be in proportion to the number of customers served. It was necessary, therefore, to combine the daily mean temperatures of the various load centers to form a composite temperature for the entire system.

For our purpose, we have adopted the degree-day deficiency method as a basis for calculating heating requirements. This system, of course, assumes that heating becomes necessary when the mean temperature for the day falls below 65°F. Therefore, the number of degrees of mean temperature below 65° is expressed as so many "degree-days."

Now that we have a composite daily mean temperature for the entire territory served it is a simple matter to compute the gas system degree-day deficiency, and if we knew to what extent the firm gas load would vary for each consumer for each degree-day of temperature change, and if we could determine what the probable temperature would be on the following day, we should be able to make a fairly accurate estimate of the next day's requirement.

Temperature Forecasts

A special study was made to determine what this variation per consumer per degree-day would be. It was then only necessary to attempt a temperature forecast for a day in advance for our load centers, to which this factor could be applied. We were aware that the weather forecasts from the San Francisco Weather Bureau Office were being made with almost uncanny accuracy. If it were possible to obtain a temperature forecast for our load centers from the Weather Bureau, greater accuracy would result in determining the probable degree-day deficiency for the gas system.

The fact that is was necessary to have our forecast before Weather Bureau records were received from their stations made it necessary for us to arrange to supply the temperature readings from our load centers.

The Weather Bureau Office gave their full cooperation and, at their request, Standard Weather Thermometers were installed in standard instrument shelters. From these instruments are read the maximum and minimum temperatures. These readings are given to the Weather Bureau by mid-afternoon and the Bureau, with the aid of this and other data, determines what the probable mean temperatures might be for the following day.

Having worked out a satisfactory method to use in calculating the variation in the firm gas load, it was a rather simple process to prepare forms suitable to its application, instituting a method of calculating the requirements which is systematic, routine, and comparatively simple. The accuracy obtained is surprising, with the error for 90 per cent of the time not greater than 5 per cent.

After the forecast of the temperatures is received and the means have been determined, they are entered on the form shown in Fig. 1. The weight or importance of temperature in each load center is then determined and added together, making a composite temperature which is representative of the system as a whole.

On the left hand side of the load sheet, (Fig. 2) the total gas used for the same day of the previous week is determined, and the amount used by the oil refineries, electric, and other large industrial plants deducted, leaving what is called the regular load. This amount is transferred to the form shown as Fig. 1.

The difference between the estimated composite temperature and the actual for the same day of the previous week is then multiplied by the degree-day firm factor, to determine the total variation of the firm load. The estimated regular load is then determined by adding or deducting this variation from the actual regular load for the same day during the previous week. The estimated regular load is transferred to the right hand side of the load sheet and the requirements of the large industrial plants added.

A producing schedule is then compiled and dispatched to the operator at Kettleman Hills, to be put into effect at a specified time.

Calculating Line Capacities

In addition to the problems already mentioned in connection with gas dispatching, it is periodically necessary, with changing load conditions in different sections of the system, to calculate line capacities for the routing of gas, to determine pressures required for given volumes of gas, and to check the lines for flow regularly.

To save time in solving these problems and simplify the application of the flow formulae, it is necessary to resort to the use of slide rules and graphs which are designed for such purposes. Usually the calculation of the capacity of pipe lines and other flow problems does not require extreme accuracy; therefore, the use of rules and graphs can be justified.

Numerous charts and tables which are very simple in their application have been developed and are used very successfully in solving many problems encountered in the operation of our system. Several of these are presented with this paper.

Charts of the type illustrated in Fig. 3 are for flow of natural gas in various sections of lines as shown. Curves are plotted to show the relation of flow in M c.f. per hour to the values of $P_1^2 - P_2^2$.

Weymouth Formula:

Q = cubic feet per hour,
D = diameter in inches,
P_1 = outlet pressure in lbs. per sq. in. absolute,
P_2 = outlet pressure in lbs. per sq. in. absolute,
L = length in miles,
S = specific gravity of gas (used .67),
Pressure base = 14.73 lbs. per sq. in.

Obstructions, caused by the accumulation of water, oil and other foreign matter in pipe lines carrying natural gas, are not uncommon. Such obstructions, if not determined and removed, in time will become of such proportion as to cause large deficiencies in the capacity of the lines. It is therefore highly important that the lines be frequently checked for flow. Charts such as shown in Fig. 3 are used principally for this purpose.

The chart shown as Fig. 4 is typical of a number which is used for calculation of flow of natural gas in lines of a diameter as indicated, and any length. Curves are plotted to show the relation of flow in M c.f. per hour to the values of

$$\frac{P_1^2 - P_2^2}{L}$$

These charts were prepared leaving the length a variable; therefore they can be used to solve many problems for pipe lines of the diameter specified.

In addition to the flow charts we have prepared tables showing the equivalent length in 22-inch pipe, for those lines consisting of sections, having different diameters in series. In our case, the solution of many flow problems is complicated by delivering gas to branch lines enroute. In such cases, it is, of course, necessary to determine what the delivery would be were all of the gas being delivered at the end of the line. For the purpose of saving time and to aid in solving these problems, we have prepared tables such as illustrated by Table No. 1.

How these reports are used can best be explained by the following example:

Assume it is desired to determine the straight through flow of the Stanpac Line for the section between Kettleman and Panoche Junction, when the delivery to the branch line at Mendota is 20,000 M c.f. per day and at Panoche the end of the section is 80,000 M c.f. per day.

First, we must square the quantity flowing in each section approaching the taps, and multiply it by the fractional distance of the respective sections. By extracting the square root of the sum of these values ($f \times Q^2$) we have what the delivery would be were all of the gas being delivered at the end of the line, which, in this case, is 92,700 M c.f. per day. Assume that the pressures are 450 lbs. inlet and 410 lbs. outlet, gauge, and it is desired to check the flow for this section. Squaring the absolute pressures and taking the difference, the value for $P_1^2 - P_2^2$ is determined. Using this value, and reading from the curve, for this section of line, on Fig. 3, the volume indicated is approximately 4,100 C c.f. per hour, or 98,400 M c.f. per day. This is a difference of 5,700 M c.f. per day between the theoretical, and the straight-through capacity as operating.

From these analyses of the problems encountered and the description of the activities of the Gas Dispatching Department, it may be seen that its work is of considerable importance in the job of giving to the people of Northern California the kind of service desired of their gas company.

MEASUREMENT and CONTROL

Gas Gravitometers

By M. T. BURTON

*Southern California Gas Company**

THE determination of the specific gravity of gases is a subject of interest and importance to all gas men and particularly, to those in the measurement field.

Unfortunately, unit volumes of gases, unlike most other commodities, may vary widely in density from time to time. Since the density of a gas enters directly into the co-efficient of flow through an orifice, the accurate measurement of gases by flow type meters places us under the necessity of accurately determining it. However, as flow coefficients are based on the density of air, we do not determine the absolute density of the gas, but rather, density compared to air or the specific gravity.

M. T. Burton

The term, specific gravity, may be defined as the ratio of the weight of a volume of gas to the weight of dry air, free from carbon dioxide, measured at the same temperature and pressure.

There are a number of methods by which the specific gravity of a gas may be determined. These methods and instruments based on them, will be discussed later, but first let us consider the ideal requirements of such a specific gravity apparatus.

The first requirement is, of course, accuracy, then dependability, ease of operation, and low cost.

The necessary accuracy for gravity determination is sometimes a matter of difference of opinion. This is but natural when we consider that a change in gravity of 1 in the third decimal place results in less than 0.1 per cent in the computed gas flow, and that the maximum accuracy of an orifice meter is probably not greater than 1 per cent.

In my opinion, third place accuracy is necessary or, at least, desirable, to insure absolute accuracy in the second place. It is quite evident that second place accuracy must be obtained. In the past, I venture to believe, even this accuracy has not always been reached.

Undoubtedly our old friend, the Law of Compensating Errors, has saved us many a cubic foot of gas, but it is difficult to state that the errors encountered are always compensating. They may be cumulative, which becomes something else not so desirable.

Therefore, let me repeat, the greatest obtainable accuracy should be the goal of every manufacturer of specific gravity instruments, and of every meterman.

Dependability is very desirable. An instrument however accurate which cannot retain its accuracy, either because of faulty design or construction, or being based on a poor principle of operation, has no proper place in our laboratories or field equipment.

Ease of operation, likewise, is desirable. Such an instrument should be so designed as to permit rapid and easy determination.

What should a specific gravity apparatus cost?

This, it will be noted, I have placed last. I believe this is the right order, but in these days cost must be considered, both first cost and operative costs, so that the instrument which gives us the most accurate and dependable readings at the most reasonable cost should be the one used.

Gas gravitometers may be either indicating or recording. Both types have their place in industry. The question of which type should be used depends upon several factors. The indicating type usually is operated on "grab" samples, picked up in a sample bomb. While this gives the gravity of the gas at the particular time of sampling, it can take no account of the changes which may occur between sampling periods. Such changes sometimes take place with startling rapidity. Again, the law of compensating errors may be of help but we have no definite assurance that such is the case. In my opinion, large scale gas measurement should not be based on "grab" samples taken at intervals, but, upon a continuously recorded gravity. Among the methods available for gravity determination are:

1. The Effusion Method, based on Graham's Law.
2. The Buoyancy Method, based on Bolye's Law.
   a. Gas Balances.
   b. Direct Buoyancy Types.
3. Those depending upon the difference in weight between a column of gas and air.
4. Dynamic Type.

The best known of the first type is the old-time Schilling Bottle, which is so well known as not to need description here. Let it suffice to say that it was unsatisfactory, giving very erratic results.

A new instrument based on this, the Effusion Method, has been invented by Messrs. Jones, Hurley, and Jiminez, all members of the Southern California Meter Association.

This apparatus, it is claimed, eliminates all of the objectionable features of the old apparatus and permits continuous determination and recording of the sample.

We are indebted to the inventors for the following description of its design and operation:

Effusion Method

"In order to explain the method used for eliminating the errors usually present in the handling of the gas during the determination of its specific gravity, we may consider that the gas as handled in this instrument is physically in the same category as superheated steam. That is, just as the boiling of water produces steam which may be removed from the presence of the boiling water and then super-heated into a dry gas, likewise, the flowing gas of a pipe line may be scrubbed of its liquid mist and then superheated to a dry gaseous condition. If the density of this super-heated mixture of gases is compared with the density of heated air at the same temperature, a true specific gravity of the mixture of gases passing through the pipe line is obtained. With this discussion in mind, let us pass to a description of the instrument that will fulfill this requirement. Fig. 1 shows a schematic drawing which may be used to explain the construction of the instrument and its mechanical operation. Briefly, the instrument consists of a liquid scrubber, a gas regulator, a dust scrubber, an orifice, a gas chamber, a mercury pump, and a recording device. Of these various parts the orifice, gas chamber, and mercury pump are enclosed within an insulated and thermostatically controlled compartment. The gas passes through the regulator, which reduces its pressure to the pressure at which the instrument has been calibrated, and thence through a liquid scrubber. From the liquid scrubber the gas is passed through a dust scrubber containing cotton and then heated by means of a pipe coil within the thermostatically controlled compartment, to a temperature of 150° F. The heated gas, held at a constant pressure, is then admitted through the orifice to the gas chamber. The admission of the gas to the gas chamber causes the operation of the instrument as follows:

"Referring to Fig. 2, an enlarged view shows the mercury pump. As the gas enters the gas chamber the mercury in the mercury pump acts as a seal, causing a rise in pressure within the chamber. This rise in pressure results in a lowering of the mercury

* Presented before the Southern California Meter Association, December 22, 1932.

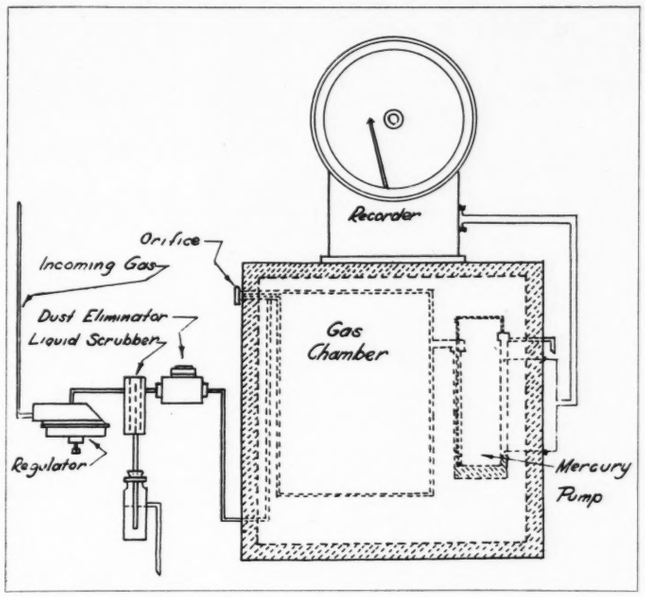


Fig. 1.

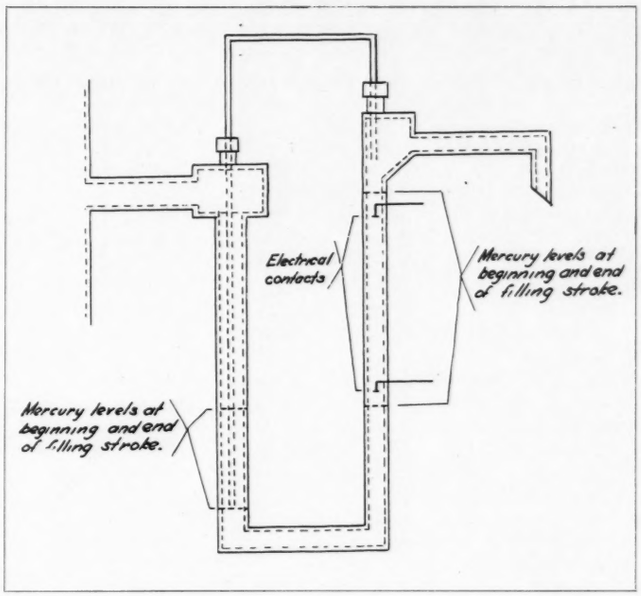

Electrical contacts
Mercury levels at beginning and end of filling stroke.
Mercury levels at beginning and end of filling stroke.

Fig. 2.

level in one leg of the mercury pump with an attendant raising of the mercury level in the other leg. This motion continues until the mercury level falls below that of the lower end of the small tube which connects the upper ends of the two legs of the mercury pump. The upper end of this small tube is open to the atmosphere. When the lower end emerges from the mercury a slight further increase in pressure causes the mercury, which has been forced up into this small tube, to be pushed up and over into the other leg of the mercury pump. After the mercury has been discharged from this small tube the gas chamber is open to the atmosphere and the gas that has been trapped within the gas chamber during the rise in pressure is liberated to the atmosphere. The subsequent drop in pressure allows the mercury in the pump to adjust its level in the two legs and the cycle commences again. Now, under the operation of controlled pressure the length of time necessary to cause this cycle to be completed will vary as the specific gravity of the gas varies. Therefore, a measurement of the filling stroke of this cycle is used for the determination of the relative densities of gases admitted. To accomplish this it is only necessary to insert two electrical contacts within the outer leg of the mercury pump and by means of an electrical recording device, indicate the specific gravity on a circular chart.

"The fact that this instrument depends upon the same physical operation as the Effusion Bottle to obtain the specific gravity undoubtedly raises some question as to its accuracy and reliability. In this regard, the precaution of removing free water from the gas has eliminated the possibility of the orifice becoming fouled with water. As stated previously, the incoming gas is scrubbed of moisture and then super-heated until it exists completetly in a gaseous state. This, then, results in the elimination of the discrepancy commonly observed in the use of the Effusion Bottle. However, there are also objections to the values obtained from the Effusion Bottle which arise within the principles involved. That is, for an orifice of the size and shape as used in the Effusion Bottle, there are other factors besides the density of the flowing gas which affect the time of outflow. Two of these factors are viscosity, and the relation of the specific heat at constant pressure to that at constant volume. The influence of the latter, however, only becomes of importance when the over-pressure of the system is much greater than that used in the instrument involved. In fact, the viscosity of various gases is the only factor that needs consideration in the design of this instrument. In this regard capable research has indicated that the effect of varying viscosities on the time of outflow of any gaseous mixture through a small orifice may be reduced to a negligible item if two details in the construction of the orifice plate are adhered to. The most important of these two details has to do with the drilling of the hole through the orifice plate. That is, if an orifice plate of 1.0 millimeter thickness has a cone-shaped hole drilled through it as shown in Sketch No. 1 of Fig. 3, the effect of viscosity on the time of outflow is minimized. In explanation, consider Sketch No. 2 of Fig. 3 which represents the normal orifice plate of the Effusion Bottle. These orifice plates are made by piercing their platinum plates with a needle. This results in the formation of very irregular shaped holes in the manufactured orifice plates. This renders them unsuitable, inasmuch as when the flow is from the narrow end of the opening to the wide end the flow is quite unstable and when the flow is in the opposite direction viscosity becomes a decisive factor. The last is true when it is recognized that the gas stream contacts the entire length of the sides of the opening. Therefore, for this instrument the special plates are made of stainless steel with cone-shaped holes, absolutely circular round and with sharp edges. The top angle of the cone may be as much as 90°. When gas flows from the narrow end of the opening to the wide end the stream touches only the sharp edge of the narrow end and thus the effect of viscosity is practically excluded. This is more truly correct when the orifice is made considerably larger than that used in the common Effusion Bottle. Consequently, an orifice of approximately 0.45 millimeter in diameter is used."

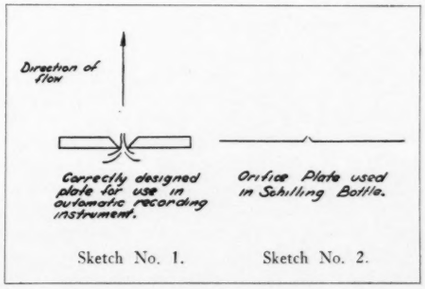

Direction of flow
Correctly designed plate for use in automatic recording instrument.
Orifice Plate used in Schilling Bottle.
Sketch No. 1.
Sketch No. 2.

Fig. 3.

The Edwards Balance

Of the second type, the Edwards Gas Balance is, perhaps, the best known representative. The use and operation of this balance is so well known as not to require description. It has proved very satisfactory as a laboratory instrument and is in standard use throughout the gas industry.

A newer addition to the balance family is the Acme Balance. This balance is much larger than the Edwards and differs chiefly in the matter of the balance suspension. The means of suspension is a pair of steel springs made very strong but flexible. The springs

may be replaced if damaged. Another unique feature is the locking device which enables the balance suspension to be rigidly locked by a turn of a lever. This permits the balance to be carried into the field where it may be set up on a tripod and used merely by unlocking the suspension.

Another type of instrument is also manufactured by Acme. This is a recording instrument and falls under the direct buoyancy type, depending for its action upon the buoyant effect of gas on a large metal bell suspended on knife edges and being counterbalanced by a weight. The instrument is compensated for changes of temperature.

The following description is furnished by the distributor:

"The gas is admitted to the gravitometer through a needle valve and then passes through a flow indicator and on through a ⅜-inch tubing and an oil seal into the float, entering at the bottom. The float is suspended from a balance bar and its weight is counterbalanced by the large balancing weight. The gas then passes out the top of the float and through another oil seal and on to the outlet. There is a certain buoyant force exerted by the air on the float which is counter-balanced by a force exerted by the calibrating weight, so that the float and balance bar are in a state of equilibrium. When the gravity of the gas passing through the float changes, the forces acting on the float are thrown out of equilibrium and the float and balance bar move to such a position that the counter-balancing force exerted by the calibrating weight is again equal to the buoyant force of air on the float and a condition of equilibrium is again established. As the pen arm is an integral part of the balance bar it also moves to such a position that the pen records the new gravity of the gas in the float.

"Changes of temperature cause slight changes in the buoyancy of the float. This change of buoyancy is overcome by the use of the automattic temperature compensator, which consists of a mercury container mounted on the balance bar, which is connected through a U-tube to a closed air tank. The U-tube and container are filled with mercury and variations in temperature will cause variations in the pressure in the closed tank which will in turn cause the amount of mercury in the container to change. This change of the amount of mercury in the container causes the pen to move the right amount to correct for the change in temperature. Variations in barometric pressure are also taken care of by this compensator."

Several instruments depending upon the differences in weight of a column of gas and the weight of a like column of air at the same temperature and pressure, are on the market.

One of these instruments was invented by Col. G. S. Binckley of Los Angeles. A description of this apparatus, known as the Anubis gravitometer, is furnished by Col. Binckley.

"Gas enters through the needle valve at the lower right, and the pressure on a small orifice at the left is limited to about 1 inch of water by the pressure regulator bottle. Excess gas is discharged through the small tube at the right. The gas to be weighed, amounting to one or two cubic feet an hour, passes through the small orifice to the base of the column, from the top of which it escapes to the atmosphere. The left hand bell has a large connection to the base of the column and is continually purged so that it contains gas of the same quality as that passing through the column.

"The two bells are suspended by long knife-edge links on a balance beam, at the center of which is a rigid pendulum. The bells are identical except that the right hand one is open to atmosphere at the top and has no gas connection. Both bells are sealed by the liquid in the lower vessels. The functions of the right hand bell are merely to balance the weights, to neutralize the buoyancy and surface tension effects on the shells of the bells, and to act as a damper.

"It will readily be seen that the pressure on the under side of the left hand bell is that at the top of the column plus that of the weight of the column of gas, while the pressure on the upper side is that at the top of the column plus that of the weight of the equal column of air. Changes in the gravity of the gas, therefore, cause changes in the pressure under the bell, and these changes cause deflections of the balance beam and its pendulum. In effect the balance is weighing in air a cylindrical volume of gas having a base of the cross sectional area of the bell, and a height equal to that of the column.

"Knowing this volume it is possible to compute the actual weights involved, and to calibrate the instrument accurately with dead weights. Variations in temperature are compensated by a thermostatic attachment on the pendulum. The movement of the balance is transmitted to the pen arm and the instrument is calibrated by dead weights to make the pen read correct specific gravities directly on the chart."

Another instrument of this type is the Domner Balance, invented in Germany. This instrument consists essentially of a U-tube with large diameter legs. This U-tube is mounted on a knife edge in a balanced position, and contains a light liquid of low vapor pressure, such as some of our light oils. One side of the tube communicates with a gas column through a mercury seal. Any change in the gravity of the gas results in a slight differential on the U-tube. This causes oil to flow from one side of the tube to the other, changing the balance position. A long pointer mounted as an integral part of the balance thus moves across a calibrated scale, indicating gravity. A pen or stylus arrangement may be furnished for use as a recording instrument.

A further use of this principle was suggested, and considerable work done some years ago by the writer with gratifying results. It depends upon the extreme sensitivity of certain types of oscillating circuits. Beat frequency phenomena are common and well understood. The old tuning fork experiment where two forks of different tone are struck, resulting in a tone equal to the difference between the two, is a familiar example. High frequency oscillating electric circuits are subject to the same phenomena, as evidenced in the squeals and howls of early radios. When such a radio frequency circuit is placed near another of the same frequency in which there is placed a telephone receiver, there is no sound heard. However, if one circuit is detuned slightly there is an audible note produced which has a frequency equal to the difference between the circuits.

Now, if the second circuit is adjusted so that the circuits are again tuned to zero beat, the change in capacity necessary to produce zero beat, is a measure of the change in the first circuit.

This is applied to the problem as follows: The gas weighing device is in effect a variable condenser changing its capacity as the gravity changes. It consists of a large diameter diaphragm of thin brass which separates the gas and air chambers. The gas chamber is of very small capacity and communicates directly with the gas column. In the air chamber is another plate of metal rigidly fixed very close to the diaphragm plate, and separated from it by air. These two plates, together with the air as a dielectric, form a condenser, the capacity of which varies with the distance between the plates.

A change in the gravity of the gas imparts a differential pressure to the diaphragm, resulting in a slight movement of it. The resulting change in capacity causes a change in frequency, setting up a beat frequency with the other oscillator.

By adjusting the second oscillator to zero beat, as previously described, the change in the balancing condenser is a measure of the change in the gravity of the gas.

This instrument can be made either as a laboratory or station recorder, or as a portable model of great simplicity.

The only instrument of the fourth type known to the writer is the Ranarex. The following description is furnished by the distributor:

"The Ranarex principle is based upon the difference in specific weight of gas and air. In this instrument a rotating motion is imparted to the gas under test by means of a motor-driven fan running in a chamber. This drives the gas against the blades of an impulse wheel located opposite the fan in the same chamber, producing a torque on the shaft of the impulse wheel; this torque being proportional to the specific weight of the gas.

"For a comparison with air a second fan and impulse wheel is located in a like chamber. The fan is driven from the same motor as the fan in the gas chamber but rotates in the opposite direction. The two impulse wheels are coupled together by means of levers and a connecting link. This coupling system prevents complete rotation of the impulse wheels, but differential torque between the gas and air impulse wheels is transmitted to a pointer passing over a scale calibrated directly in specific gravity. The Ranarex is indicating and recording."

The writer wishes to acknowledge with thanks the assistance given by Col. G. S. Binckley, Messrs. Hurley, Jiminez and Jones, the Braun Corp. and the Permutit Co.

New Gas Well Extends Hugoton Field

A new gas well was brought in on December 9 which is reported to extend the Hugoton gas field of Kansas 32 miles farther north. The well was put on production at 7,000,000 cubic feet daily by J. E. Denham and Lou Myers of Dodge City, Kan.

S. C. M. A. in Annual Christmas Party, December 22

THE December meeting of the Southern California Meter Association took place at the Rio Hondo Country Club near Downey, Calif., on the 22nd of the month. This was the Association's annual Christmas party, and an attendance of 50 members was present to participate. As a part of the Christmas atmosphere, Southern California Gas Co.'s quartet provided a number of enjoyable vocal selections.

Following the dinner President Des Brisay turned the meeting over to Program Committee Chairman Cereghino, and two papers which developed an unusual amount of general discussion were presented. Wm. Wright of the Union Oil Co. gave a discussion of "Metals and Alloys Used in Measurement", which will be published in an early issue of *Western Gas.* This issue presents the second paper on the December program, "Gas Gravitometers," given by M. T. Burton of the Southern California Gas Co.

Worth Bates, Lexington, Mo., Passes; L. F. Benz Named to Vacant Post

Worth Bates, for seven years vice-president and general manager of the Missouri Gas & Electric Service Co., Lexington, Mo., passed away at Lexington on November 23. Mr. Bates had been with the company since 1907, when it was known as the Lexington Gas & Electric Co. On January 1, 1916, he was made treasurer of the company and in 1927 was elevated to the post he held at the time of his death.

L. F. Benz, formerly district superintendent of the Kansas Electric Power Co. at Emporia, Kan., has been named to fill the post left vacant by the death of Mr. Bates.

John W. Moore Construction Co. to Construct Line to Lubbock

The John W. Moore Construction Co., Lubbock, Texas, according to press report, plans construction of a natural gas transmission line to serve Lubbock, where the company was granted a franchise recently. Source of supply has been named as the Hobbs field in eastern New Mexico, and a line from this field would be approximately 100 miles long. The company has applied also for franchise to serve Brownfield and Seagraves, these towns being on the route of the proposed line.

According to the franchise, construction of the line must begin by May 15, 1933, and service must begin by November 1, 1933.

Minnesota Northern Natural Gas Co. Odorizing Its Gas Supply

Minnesota Northern Natural Gas Co., with state headquarters at Rochester, Minn., is installing odorizing equipment in all of its properties, which include distribution systems in Rochester, Wells, Mantorville, Byron, Alden, New Richland, Kasson and Dodge Center, Minn.

Preliminary Statistics Released by A. G. A.

PRELIMINARY estimates on the manufactured and natural gas industries for the year 1932 as compared with 1931, have been released by the Statistical Department of the American Gas Association, of which Paul Ryan is statistician.

MANUFACTURED GAS INDUSTRY

	1932	*1931*	*Percent Change*
Gas Customers at End of Year			
Domestic	9,504,100	9,848,800	— 3.5
House Heating	65,200	58,700	+ 11.0
Industrial and Commercial	483,500	487,900	— 0.9
Miscellaneous	7,500	7,200	— ....
Total	10,060,300	10,402,600	— 3.3
Gas Sales to Consumers (Thousand Cu. Ft.)			
Domestic	269,220,300	276,975,600	— 2.8
House Heating	20,445,600	19,908,100	+ 2.7
Industrial and Commercial	80,625,000	92,248,300	— 12.6
Miscellaneous	1,993,000	2,065,300	— ....
Total	372,283,900	391,197,300	— 4.8
Revenue from Sale of Gas to Consumers			
Domestic	$ 324,695,200	$ 335,428,900	— 3.2
House Heating	15,226,300	16,061,500	— 5.2
Industrial and Commercial	71,928,000	82,297,500	— 12.6
Miscellaneous	1,398,700	1,602,200	— ....
Total	$ 413,248,200	$ 435,390,100	— 5.1

NATURAL GAS INDUSTRY

Gas Customers at End of Year			
Domestic	5,025,000	5,089,000	— 1.3
Commercial	442,000	438,000	+ 0.9
Industrial	23,000	23,000	0.0
Total	5,490,000	5,550,000	— 1.1
Summary of Natural Gas Sales—M. C. E.			
Utility Sales			
Domestic	271,000,000	288,959,000	— 6.2
Commercial	83,000,000	85,419,000	— 2.8
Industrial	455,000,000	535,696,000	— 15.1
Total Utility	809,000,000	910,074,000	— 11.1
Non-Utility Sales			
Carbon Black and Field Use	601,000,000	767,761,000	— 21.7
Total Natural Gas Sales	1,410,000,000	1,677,835,000	— 16.0
Summary of Natural Gas Revenue			
Utility Sales			
Domestic	$ 191,000,000	$ 201,560,000	— 5.2
Commercial	39,000,000	40,254,000	— 3.1
Industrial	77,000,000	97,399,000	— 20.9
Total Utility	$ 307,000,000	$ 339,213,000	— 9.5
Non-Utility Sales			
Carbon Black and Field Use	$ 35,000,000	$ 44,517,000	— 21.4
Total Natural Gas Sales	$ 342,000,000	$ 383,730,000	— 10.9

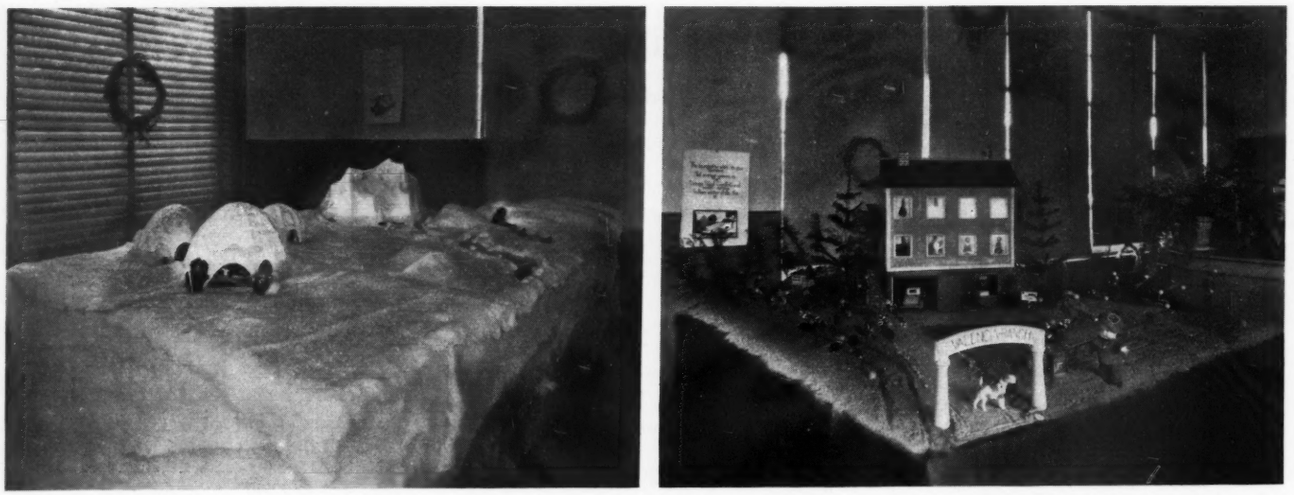
January 17 Set for Hearing on Application To Serve 23 Iowa Towns

Applications of the Natural Gas Pipe Line Co. of America, of Chicago, Ill., for permission to extend its natural gas pipe lines to 23 Iowa cities will be considered on January 17 by the Iowa State Railroad Commission. The Commission in announcing the hearings, states that the company's applications involve the laying of 200 miles of pipe, mostly of 2 and 3-inch pipe, with a 10-inch line to extend across the Mississippi River to connect the city of Davenport, Iowa, with the main line. In addition to Davenport, the cities the company proposes to add to its lines are Malvern, Clarinda, Osceola, Chariton, Ottumwa, Fairfield, Centerville, Albia, Oskaloosa, Sigourney, Iowa City, Coralville, Cedar Rapids, Riverside, North Liberty, Keota, Washington, Wapello, Mount Pleasant, Burlington, Fort Madison and Keokuk.

Robertshaw AutomatiCook Display Available to Dealers

An interesting display piece, designed for use in window trims or floor displays, is being offered to dealers handling gas ranges equipped with the Robertshaw "AutomatiCook" oven control. This display is designed for placing on the range so that it calls attention to the Robertshaw oven control.

The display will be supplied without charge to companies addressing the Robertshaw Thermostat Co., Youngwood, Pa., mentioning the number of displays desired.



Life in an Arctic igloo, or in a Blue Star home surrounded by citrus trees—the Orange office of Southern Counties Co. offers this choice in its first prize entry for the company's 1932 Christmas display contest.

An Inter-Office Window and Floor Display Contest

(Continued from Page 13)

intriguing presentations of plans which have been used before. Each year produces something fresh—not in one office or two or three, but in all of the offices, generally, throughout Southern Counties' system. As a creator of employee enthusiasm and interest in the important work of maintaining displays which please, which attract attention and which appeal to the consumer, these contests have an important place in our advertising and merchandising picture. The findings of the Committee of Judges for our 1932 contest belong in any presentation of this subject at this time. Here they are:

Mr. W. D. Thurber
Advertising Manager
Southern Counties Gas Company

Your Committee of Judges for the 1932 Christmas Window and Floor Display Contest, has visited all of the offices which were entered in the competition from every district.

We were impressed with the enthusiasm of the district employees who entered into the competition with true Southern Counties' spirit. The displays, generally speaking, were unusually attractive and illustrative of the ideals behind the contest.

In presenting the following findings, the committee decisions in every case were unanimous:

District Office Display: First prize to the Orange County District office at Santa Ana. The award was made to this office because the "Spirit of Christmas" was interpreted with distinctive originality. The "Service" and "Selling" appeals were exceptionally well conveyed.

Second prize was awarded to the Santa Monica District office for the beauty of its display coupled with the dignity of its selling appeal which earned a high rating.

Honorable Mention is given to the Santa Barbara District Office for the manner in which the appliance displays were surrounded with the full Christmas environment.

Sub-District Office Display: First prize was awarded the Orange office in the Orange County District because it was exceptionally complete in its selling and service appeal, together with a high degree of originality and seasonal spirit.

Second prize is awarded to the West Los Angeles office in the Santa Monica district because of the contrast between the "old" and the "new" which was so effectively brought out in this display.

Honorable Mention is given to the Brea office in the Orange County district because of its fine dramatization of the Christmas theme in conjunction with a good selling display.

Respectfully submitted,

A. L. SPRING
C. P. BARRETT
J. S. SPAULDING.

So far, we have had these contests only at the Christmas Season. It may be that some day the idea may be extended to include some other special occasions during the year which will afford new opportunity for the expression of employee initiative and originality in the creation of customer-compelling floor and window advertising.

R. R. Commissioners Assn. Elects J. Paul Kuhn as President

The National Association of Railroad and Utilities Commissioners held its annual convention at Hot Springs, Ark., on November 15, 16 and 17. Practically every state in the union was represented, as well as the island of Porto Rico. Officers elected during the convention to serve for the coming year are: J. Paul Kuhn, Chicago, Ill., president; Amos A. Betts, Phoenix, Ariz., first vice-president; Honorable H. Lester Hooker, Richmond, Va., second vice-president; Honorable James B. Walker, New York, secretary.

The next annual convention will be held at Cincinnati, Ohio, October 10-13 inclusive, 1933.

Annual Convention of Northwest Gas Assn. Dates Now Jan. 12-14

The Annual Convention of the Northwest Oil and Gas Association, planned for the first week in December, will be held January 12, 13 and 14 at the Olympic Hotel in Seattle. The principal guest speaker will be Dr. Charles E. Weaver of the University of Washington; other speakers include Harold E. Culver, State of Washington Supervisor of Geology; R. B. Newbern, president, Northwestern Natural Gas Corp.; Henry Landes, dean of the College of Science, University of Washington; Mordelo L. Vincent, Jr., on "Use of the Torsion Balance and Magnetometer in Northwest Washington". Governor-elect Martin will also speak.

Papers will be presented at noonday luncheon sessions open to the general public on the 13th and 14th.

To Build Gas Line from Hobbs Field to Lea Section

The Texas Co. is reported to be planning construction of a 24-mile gas line from the Hobbs pool to the Lea field, N. M., the gas to be used in pumping oil wells in the Lea section where there is insufficient natural gas supply.

COMMITTEE:
DOUGLAS BUCKLER, SO. CALIF. GAS CO.
J. EARL JONES . . . SEATTLE GAS CO.
J. CHARLES JORDAN (CHAIRMAN) P. G. & E.
F. U. NAYLOR . . . . . P. G. & E.
E. P. RAMSAY . . . . L. A. G. & E. CO.

HEADQUARTERS:
PACIFIC COAST GAS ASSOCIATION
447 SUTTER STREET SAN FRANCISCO
H. L. MASSER (L. A. G. & E. CO.) PRESIDENT
CLIFFORD JOHNSTONE, MNG. DIRECTOR

P. C. G. A. CO-OPERATIVE ADVERTISING NEWS

WATCH THIS SPACE FOR NEWS OF CAMPAIGN

This page in Western Gas will be devoted during 1933 to news of the cooperative advertising, replacing bulletins formerly mailed by the Association. Follow the campaign and see reproductions of the advertisements here each month.

1933 CAMPAIGN IS OFF TO A FLYING START

The gas industry's trade journal advertising entered its fifth consecutive year when plans for the next 12 months were approved by the Cooperative Advertising Committee, meeting at the Association offices in San Francisco early in December.

The current campaign is largely concentrated in industrial fields. Curtailment of the appropriation, for economy reasons, resulted in temporary elimination of other advertising media.

Economies of the Campaign

Through this P. C. G. A. cooperative plan, the gas companies are enabled to employ efficiently, media having statewide and coastwide circulation—such as important trade journals of general coverage. Similarly, radio, Sunset Magazine and outdoor posters have been used for consumer influence in previous years.

New Agency is Appointed

Hamman-Lesan Company (our former advertising agency) retired from business on December 31. However, Jas. C. Knollin who, as a member of that firm, has handled the advertising of the Association since its inception, will continue this work under the Committee's direction during 1933. Knollin having become Vice-President of Bowman-Deute-Cummings, Inc., a national agency with offices in San Francisco and Los Angeles, the latter firm has been officially appointed as our agency.

COMPLETE COVERAGE IN 11 CLASSIFICATIONS

Nineteen publications, covering *eleven* classifications, appear on the 1933 advertising schedule. Their combined circulation is approximately 80,000, which means not less than 300,000 readers each month.

Appliance Dealers
Western Appliance Retailing. 12 pp.
Plumbing Contractors
Western Plumbing & Heating Journal . . . . . 12-⅔ pp.
Architecture
California Arts & Architecture . . . . . 6 pp. and 6-⅛ pp.
Architect & Engineer . . . . . 6 pp. and 6-⅛ pp.
Building Trades
Pacific Builder & Engineer. 12-⅔ pp.
Southwest Builder & Contractor . . . . . 12-⅔ pp.
Baking
Western Baker . . . . . 12 pp.
Confectioners
Western Confectioner & Ice Cream News . . . . . 12 pp.
Dairy Industry
Pacific Dairy Review . . . . . 12 pp.
Hotels, Restaurants, Caterers
Hotel News of the West . . . . 4-⅔ pp.
Keeler's Pacific Hotel Review . . . . . 4-⅔ pp.
Pacific Coast Record . . . . . 6-⅔ pp.
Pacific Coast Chef . . . . . 4-⅔ pp.
Pacific N.W. Caterer & Steward 4 pp.
Western Hotel Reporter . . . . 4-⅔ pp.
Western Restaurant . . . . . 6-⅔ pp.
Laundries, Dry Cleaners
Pacific Laundry Journal and Dry Cleaner . . . . . 12 pp.
Machinery
Western Machinery & Steel . . 12 pp.
Factories
Pacific Factory . . . . . 12 pp.

The Campaign Slogan . . .

Quick Clean Economical **Gas** the modern fuel

THE Industrial Gas Engineer yearly serves hundreds of plant owners in scores of industries. He has at his fingertips, the knowledge gained from thousands of gas installations.

Will modern gas-fired equipment cut your costs? Improve your results? Help you make satisfactory profits? The Industrial Engineer can tell you. No charge or obligation. Just write or phone your local gas company.

PACIFIC COAST GAS ASSOCIATION (of which your gas company is a member) 447 Sutter Street, San Francisco, California

Gas the modern fuel

FIRST AD, NEW SERIES

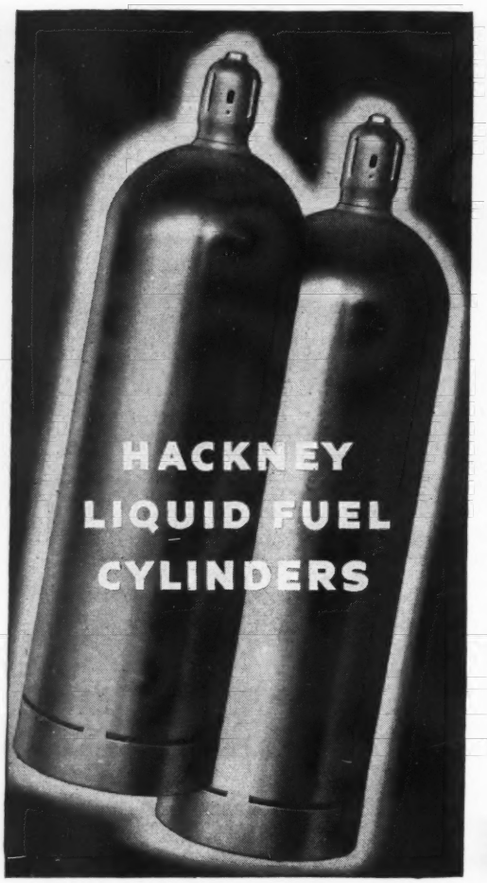
Setting the keynote for 1933, the advertisement reproduced above in miniature, features the *Industrial Engineer*. The personal service offered by this important member of the gas company's organization will be exemplified throughout the series by a "phantom" figure, in white or black silhouette. This first advertisement is for general use. Others will feature specific installations, with photographic illustrations.

1932 PUBLICITY RESULTS

Indicating the importance and value of our news service are these actual results for the year just closed. 139 feature articles (many illustrated) and short items were published in Pacific Coast trade journals. These were divided as follows:

Heating and air conditioning	19
Industrial gas utilization	31
Cooking (hotel and restaurant)	44
Baking	11
Dairy	3
Laundry plants	12
Merchandising	14
Confectionery plants	5
Total	139

Our effective publicity work will be continued during 1933. An experienced writer is retained to specialize in this technical news service.



LONG EXPERIENCE WIDE ACCEPTANCE

Hackney has designed and built cylinders for more than 25 years, and has produced cylinders for Butane and Propane and Propane-Butane mixtures since their development.

As evidence of the wide acceptance of Hackney cylinders, a partial list of users includes: Standard Oil (California), Shell Petroleum Company, Phillips Petroleum Co., Protane Corporation, Pennsylvania Salt Co., Air Reduction Sales Co., Frigidaire, Ansul Chemical Co.

Hackney engineers are pleased to work with users of cylinders for the transportation and storage of Butane, Propane, and Propane-Butane Mixtures.

PRESSED STEEL TANK COMPANY

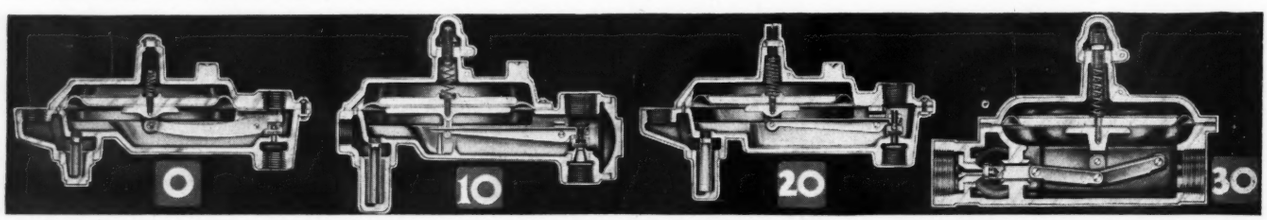
1185—208 S. La Salle St. Bldg., Chicago, Ill. 6633 Greenfield Ave., Milwaukee, Wis.
1363 Vanderbilt Concourse Bldg., New York, N. Y. 501 Roosevelt Bldg., Los Angeles, Calif.

Hackney
MILWAUKEE

CONTAINERS FOR GASES, LIQUIDS AND SOLIDS

Capacity to do the Job:

Reynolds Regulators are designed and built to handle the maximum and minimum requirements. To be sure of this, Reynolds test their Service Regulators through a complete range of operating conditions. And the fact that the physical conditions on various jobs are different, only attests the superiority of Reynolds Regulators—because the hundreds of thousands serving satisfactorily today, after years of work, is the actual proof. Reynolds Engineering Department is always glad and ready to co-operate in working out Gas Control problems. Let them work with you. Write Branch Offices or Representatives.



MODEL 0—With or without Mercury Seal. The Old Standard has served successfully for more than thirty years.

MODEL 10—All parts interchangeable and accessible while regulator is in pipe line. Built in either Spring or Dead Weight.

MODEL 20—All parts so accessible as to permit interchangeability in the shop. Built in Spring or Dead Weight.

MODEL 30—Features toggle type, lever control. Built in either Horizontal or Vertical connections and in Spring or Dead Weight.

REYNOLDS BRANCH OFFICES:
422 Dwight Building, Kansas City, Mo.
2nd Unit, Santa Fe Building, Dallas, Texas.

REPRESENTATIVES:
Eastern Appliance Co., Boston, Mass.
F. E. Newberry, Avon, N. J.

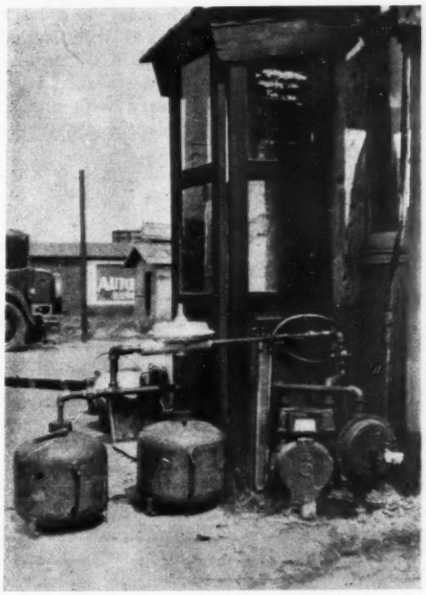
REYNOLDS GAS REGULATOR COMPANY, Anderson, Ind., U.S.A.

RECOGNIZED GAS CONTROL SINCE 1892

BUTANE - PROPANE NEWS

Covering Liquefied Petroleum Gas Service

Gas Distribution Departments Provide Growing Market



Rendering emergency service to a small restaurant with a butane-propane mixture; two liquid containers are shown connected to the service line, with Type B Reliance regulator supplying pressure control.

PRESENT developments indicate that the distribution departments of both manufactured and natural gas companies will shortly be purchasing liquefied petroleum gas products in some quantity for numerous uses in their routine operations. A few companies in eastern United States have already demonstrated the feasibility of using bottled gas to serve customers during temporary shut-downs, and independent experiments have been under way in the same field on the west coast for some time.

The experience of the Southern California Gas Co., which for several months has been using some bottled gas for temporary customer service during distribution main shut-downs, and also for miscellaneous uses in its own distribution operations such as for firing tar pots, is highly favorable to the extension of this practice. Some of the instances in which bottled gas has been particularly helpful are recounted by Lee Holtz, general superintendent of manufacture and distribution for the company.

Industrial and domestic customers have both used bottled gas for short periods with complete satisfaction. In one recent instance, leakage repair work would have necessitated a 24-hour shut-down of gas in the Chrysler Motor Car Co.'s Los Angeles plant. Several small bottled gas tanks were manifolded and the consumer taken care of satisfactorily. A rivet furnace in the Chrysler plant was fired with bottled gas during this period. This furnace used compressed air for its primary air supply, and the orifice adjustment was found sufficiently flexible to burn the butane-propane product very successfully.

In another case a small restaurant was temporarily served, this installation being shown in an accompanying view. Two 4-gallon tanks were connected with a Reliance Type B regulator and tied into the house line without disturbing the meter set-up. The meter was then cut off and bottled gas put into service. For this consumer the range was adjusted satisfactorily; the water heater was fitted with a set orifice and therefore had to be controlled by the burner valve and the flame kept low. During the two and a half hour period of the main repair this gave excellent results.

Another restaurant was served with bottled gas due to a main shut-down which came at a time when a banquet was in progress. The extra demand upon the appliances was handled with no difficulty. In instances of this sort customer relations obviously benefit from the gas company's readiness to provide emergency service.

Twenty-one residences located along a transmission line which was cut off for leakage repairs would have been without gas for 24 hours, but due to advance arrangements being made for bottled gas equipment and minor appliance adjustments, service went on as usual. The comment of the foreman in charge, following service to these 21 users, is as follows:

"We have found that by installing a regulator on the small tank and then connecting from the outlet of the regulator to the house line it only requires a simple adjustment at the appliance to give satisfactory service, equivalent to our ordinary service."

Southern California Gas Co. has used the small 4-gallon tanks of the type shown in the view, thus far in its work. It is also prepared to supply service from a 30-gallon tank, for larger users. Where there is danger of the regulator freezing up due to a heavy demand upon a single small tank, several of these are manifolded. The 4-gallon size represents the equivalent of about 250 cubic feet of 1100 B.t.u. natural gas and will last an ordinary residential customer for an entire day.

Expense of this service, in the Southern California Gas Co. experience, is nominal. Delivery of the tanks is easily made and appliance adjustment is handled by the regular order men. The bottled gas is furnished free to the customer, this cost being more than offset by other savings involved. The company feels that this method of emergency service insures good customer relations, and at the same time offers economies in many special cases where temporary main extensions would have to be laid for excessive distances to take care of customers such as industrials or semi-industrials, or residences where sickness exists. Cost studies have been made in several cases of this type, with bottled gas showing up very favorably. An example is a case where a distribution main was to be shut down for an entire block. Residences in the block could be cut off temporarily, but a single restaurant user would have made it necessary to lay an emergency line had not bottled gas been available. In another case a feed line running for a full block was to be shut down for a two-week period while street grading proceeded. It would have been necessary to lay 150 feet of temporary service line to handle the one customer affected.

Another element in favor of bottled gas for service of this sort is that of safety. Emergency lines laid above ground sometimes offer hazards, which could be avoided by using bottled gas.

Order men handling the appliance adjustment are given training now as the jobs arise. However, the company's distribution department contemplates giving all service men experience in butane-propane appliance adjustment in the near future.

Southern California Gas Co. has added about 100 of the small-size tanks to its equipment, and plans to extend temporary bottled gas service of the nature outlined, where costs justify. Also, larger tanks will be used for keeping small industrial boilers, candy kettles, varnish pots, small bakeries and other semi-industrials "in gas" during emergency or temporary shut-down. For these industrial and commercial users every gas company has

difficulty in arranging convenient times for shut-down.

The fuel mixture at present being used runs about 60 per cent propane and 40 per cent butane. This is of course subject to variance with temperature conditions in other sections.

In its distribution work bottled gas is now being used by Southern California Gas Co. under tar kettles. The portable kettles required for making joints after field welding previously used wood or distillate for heating. Larger stationary kettles used either wood or piped gas. Both small and large kettles are satisfactorily served with bottled gas. The Southern California Gas Co. has used the small 4-gallon tanks, several hooked up to a kettle where necessary, with success. Larger jobs could conveniently use larger size tanks.

Los Angeles Gas and Electric Corp. is also using an increasing quantity of butane-propane for distribution purposes. According to W. M. Henderson, superintendent of distribution for the company, 1,630 gallons of liquid butane-propane mixture have been utilized in the last three-month period. The L. A. G. and E. handles its own resurfacing of streets in some sections of its service area and uses butane-propane to heat road oil for this purpose. Field heating of asphalt kettles in connection with main extension and repair work is of course another principal use. Some 15-gallon tanks are supplied the company, and a larger number of 5-gallon size are used for small repair crews. Upwards of 50 tanks of the 5-gallon size have been added to the distribution department's permanent equipment.

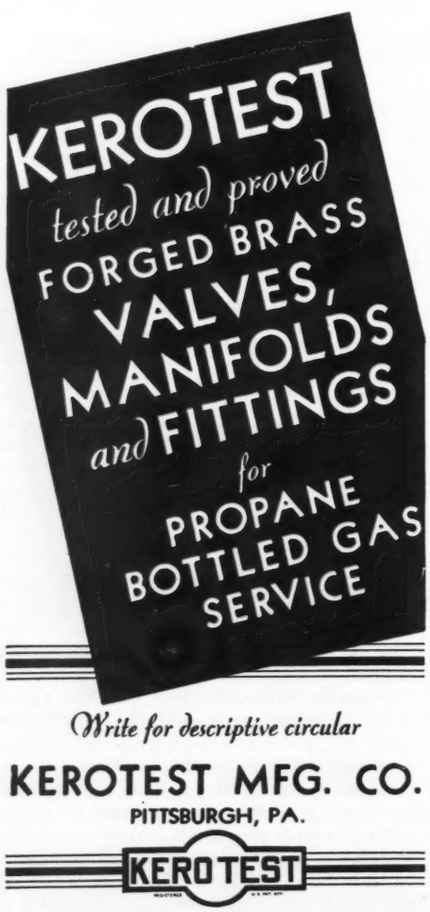
National Bottled Gas Association and Compressed Gas Men to Meet

THE conventions of the National Bottled Gas Association and the Compressed Gas Manufacturers Association, with which the former may soon become affiliated, are being held January 23-24 at the Hotel Waldorf Astoria, New York. Certain of the meetings in which there will be mutual interest will be held jointly. The occasion marks the annual meeting of the Compressed Gas Manufacturers Association. The Bottled Gas Association members have been meeting three times a year.

Papers prepared for the C.G.M.A. meeting will show the inter-relation of the compressed gas industries and the extent to which other industries depend upon compressed and liquefied gases. Papers prepared by the Bottled Gas Association, which will provide a unit in the complete program, will show the dependence of industries upon bottled gas; upon liquefied gases for gas manufacture, for peak load and enrichment; and upon liquefied gases for industrial uses in tank car units.

The board of directors of the National Bottled Gas Association will meet on the morning of January 23. At noon that association attends a luncheon under the auspices of the Compressed Gas Manufacturers Association, afterward meeting with this association for the afternoon of papers. The general business meeting of the Bottled Gas men will be held on Tuesday morning, followed by a luncheon of the two bodies, sponsored by the Bottled Gas Association. The annual banquet of the C.G.M.A. will be held Tuesday evening, the bottled gas men being invited.

Under the proposed plan whereby the National Bottled Gas Association will become affiliated with the Compressed Gas Manufacturers Association, the two groups retain their individual corporate bodies. F. R. Featherston, secretary and treasurer of the C.G.M.A., will also serve as secretary and treasurer of the National Bottled Gas Association. Mark Anton, president of the Suburban Gas Co., is president of the National Bottled Gas Association.



Write for descriptive circular
KEROTEST MFG. CO.
PITTSBURGH, PA.
KEROTEST

Record Send-Out for Butane Gas at Brawley, Calif.

Fred Huston, manager of the Natural Gas Corp., of California at Brawley, Calif., states that gas consumption records in Imperial Valley were broken on Tuesday, December 13, with a sendout of 128,640 cubic feet. The company serves butane gas at Brawley.

Daily Average Sales and Production of Liquefied in California Gains

Daily average production of liquefied petroleum gases in California increased from 387 barrels to 408 barrels in November, and daily average sales increased from 366 barrels to 420 barrels, according to a report on "The Petroleum Situation in Pacific Coast Territory," compiled by Edward T. Knudsen, Petroleum Economics Division, San Francisco, Calif. E. B. Swanson, Washington, D. C., is chief economist of the Division.

Lyon County Natural Gas Co. to Sell Skelgas Out of Marshall

Lyon County Natural Gas Co. has taken over the business of Jacob Jacobson in Marshall, Minn., and will handle Skelgas equipment, including also gas ranges, hot water heaters and restaurant equipment, for Lyon and Lincoln counties. W. A. Reklau will have charge of the office, and Mr. Jacobson will remain in the business, handling city sales and service.

Baker System May Be Changed to Use Butane

Press reports from the Oregon area state that the Eastern Oregon Light and Power Co. of Baker, Ore., is considering changing its Baker system to use butane gas instead of the straight coal gas being served there. The change would involve an expenditure of about $8,000 for new equipment.

C. L. Kerr Now Located on Pacific Coast

C. L. Kerr, president of Rockgas Products Co., Pittsburgh, Pa., has moved to Long Beach, Calif., and will be actively identified with the Imperial Gas Co. which is headquartered in that city with A. N. Kerr as president. He has been treasurer of the Imperial Gas Co. since its organization in 1925.

Detroit Lakes Gas Co. To Serve L. P. G. at Glyndon, Minn.

A 20-year franchise has been granted to the Detroit Lakes Gas Co., Detroit Lakes, Minn., giving that company the privilege of constructing, maintaining and operating a system for serving liquefied petroleum gas in Glyndon, Minn.

Peoples Gas Co. of Kentucky Buys Kengreen Gas Utilities

An application for permission to purchase the properties of the Kengreen Gas Utilities Corp., headquartered at Corbin, Ky., by the Peoples Gas Co. of Kentucky, Inc., subsidiary of Petroleum Exploration Co., with state headquarters at Lexington, Ky., has been granted by the Kentucky Utilities Commission. The offer was reported to be $58,500 cash.

Class in Liquid Gas Problems Under Oliver Begins January 5

THE University of California Extension Division, Los Angeles, early in January is beginning a course of instruction in all phases of liquid gas utilization and distribution, with Graydon Oliver, consulting petroleum engineer, as instructor. Mr. Oliver is a specialist in natural gas and liquid gas problems.

Graydon Oliver

The course has been designed primarily for the layman, and in the 15 weeks duration, will cover problems of manufacture, distribution, sales, rate structures, competing fuels, franchises, and allied subjects. Classes will meet Thursday evenings from 7 to 9.

On Tuesday evening at the same hour the courses in natural gas engineering is continuing, also under the direction of Mr. Oliver.

Headquarters of Natural Gas Corp. of California Now Santa Cruz

At a meeting held recently in San Francisco, J. B. Wilson was named president of the Natural Gas Corp. of California, and headquarters were moved to Santa Cruz, where Mr. Wilson also maintains headquarters as president of Coast Counties Gas and Electric Co. E. M. Lindsey retains his position as vice-president and general manager of Natural Gas Corp. of California, and his offices are moved to Santa Cruz.

Mr. Wilson also has been named president of Westside Natural Gas Co., and headquarters of that company have been moved to Santa Cruz from San Francisco. J. I. McKean remains with the company as manager, and will keep his office at Taft, reporting directly to Mr. Wilson at Santa Cruz.

Good Housekeeping Institute Publishes Bulletin on Gas Ranges

Good Housekeeping Bulletin Service, New York City, in December brought from the press a bulletin "Cooking With Your Gas Range"—the first bulletin devoted wholly to gas which Good Housekeeping Institute has published. Katharine Fisher is director of the Institute. In addition to answering questions concerning cooking with gas, which by the way, feature the flexibility, convenience, and attractiveness of the modern gas range—the bulletin also gives recipes for oven dinners, mixed grill dinners, top stove dinners, dutch oven dinners, waterless cooker dinners and steam pressure cooker dinners.

Z. W. Smith, Crowell, Texas, Dies

Z. W. Smith, vice-president of the Texas Natural Gas Co., Crowell, Texas, passed away Wednesday, December 21, 1932, at the age of 49. Mr. Smith had been with the company at Crowell for five years.

SCAIFE

I. C. C. CYLINDERS

A majority of distributors of Liquefied Petroleum Gas now use the Scaife cylinder.

SAFE

ECONOMICAL

GOOD LOOKING

FOUNDED 1802

WM. B. SCAIFE & SONS Co.

Oakmont, Pa. (Pittsburgh District)

New York Pittsburgh Chicago

GROBLE REGULATORS & GOVERNORS

Complete Line of Regulators for

Natural, Manufactured, Butane and Propane Gas

Pacific Coast Representative,

T. G. ARROWSMITH COMPANY,

661 Howard Street San Francisco, Calif.

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GROBLE GAS REGULATOR COMPANY

Office and Factory: Anderson, Indiana

The Servicing and Adjustment of House Heating Equipment

(Continued from Page 14)

gas to the burner. After the burner is properly installed and adjusted, where possible, we instruct the owner in the operation of the burner.

This instruction to the customer in the operating of the heating equipment, especially the lighting of the pilot, is important where a company has a large number of installations. For instance, if a failure of gas should occur, it would help immeasurably if most of the customers were capable of lighting their own furnaces. Our company, during the first heating season, discouraged the customers in doing anything with their furnaces, but we found that as more furnaces were installed we were approaching a point where we could not give proper and satisfactory service in the starting of customers' heating plants in the fall. In order to relieve this situation this past summer we instituted a new plan of instructing each customer how to light the pilot and start his own furnace, and at the same time we made a complete inspection of the customer's heating plant. An instruction card was worked out and placed on each furnace along with tags on each valve and the switch-box. This system worked out very successfully for the first year, as out of approximately 1800 furnaces installed by our company 1100 of them were started by the customers. This, of course, relieves the service department of considerable work, especially at the time when a large number of furnaces and burners are being installed.

Causes of Complaints

But with all of the above precautions there will still be a number of service calls. Pilots will go out, motor valves will get out of order and many other things occur that will cause service calls. There is nothing to become alarmed about in servicing home heating equipment. We use only two furnace service men with approximately 2000 jobs installed, and our service calls are less than 20 per day during the coldest weather.

Pilot lights and humidifiers cause the largest percentage of service calls. Approximately 30 per cent of all service calls are pilot light trouble and about 12 per cent automatic humidifier trouble. The balance is made up largely of calls due to motor valves, thermostats, electric supply, gas consumption, burner adjustments and a few gas leaks.

Most conversion burners and gas furnaces are usually equipped with safety pilots. Draft conditions, especially on high windy days, in some cases cause pilots to go out. Dirt or small particles of scale dropping down on the orifice can cause much trouble. Pilots not burning high enough to heat the element cause trouble, while, if they burn too high, they cause complaint from the customer.

Automatic humidifiers sometimes fail to function. The float will spring a leak; the valve seats will corrode and cause trouble and the chemical makeup of the water itself will cause corrosion on the sides, necessitating cleaning.

Motor valves occasionally hum, which indicates the need of oiling. They may also refuse to operate due to some mechanical failure within.

Thermostats are very sensitive to heat and cold and should be properly located in the room of the house which is used for the living room or sitting room, and installed on an inside wall. Keep them from above registers or directly on a warm air pipe to second floor. Do not locate them above radios as the heat from the radio tubes will cause improper operation.

The foregoing cover briefly the causes of most service calls from the mechanical angle. Our records indicate that we have service calls amounting to approximately 25 per cent of the jobs installed, but we find that about 100 of these, or one-fifth of the total calls, are "no trouble" calls.

The Human Element

This brings us to the one big thing that causes a large number of useless calls, and that is the human element. When a customer purchases a gas furnace or conversion burner he is purchasing something entirely new. It is only natural that he is curious to the point of investigating everything he sees about the burner. This is only right and proper, but it does cause some service calls which are really "explanation" calls. These can be cut down considerably by proper explanation at the time of installation.

When a burner or furnace is installed in the customer's home there is usually a very close check made by the customer on room temperatures. For example, he will take a thermometer and hang it on the wall along side of the thermostat. If the thermostat does not check with the thermometer, a call is immediately made to the company to send a man to see what the trouble is. It is true that, occasionally, a thermostat will be out of adjustment a few degrees, but it is also true that some of these "give away" thermometers which the customers use are incorrectly calibrated.

In another instance, there is sometimes a difference of opinion between the husband and wife as to the correct temperature, or as to the desired temperature. The wife will want the room at 80 degrees, and the husband will be content at 72 degrees. Sometimes it takes a real diplomat to settle the differences because after they have argued between themselves they might decide that there is something wrong with the heating plant, and that it should be able to furnish the two desired temperatures at the same time. These cases are actual. We have had them to contend with.

Customers are very suspicious of odors. If any odor is noticed in the room, they immediately call the company, explaining that gas odor is coming from their registers. This, of course requires a service call and a complete check of the heating equipment. In the overwhelming majority of cases it develops that there either was no odor at all, or it originated from some other source than the heating plant.

Usually, however, after the first heating season's experience with a gas furnace or conversion burner, service calls of all kinds drop off materially insofar as the old customers are concerned. It is the newly installed job that gives us the greatest trouble, and requires considerable education of the customer as to proper operation and function of the heating equipment.

This all leads us back once more to the type of man who is servicing home heating equipment. Perhaps we have mis-named him in calling him a service man. Maybe we should call him a diplomat, for in a great many cases there is no mechanical servicing required. However, diplomacy and tact are always needed in abundance, in maintaining the good will of the customer and yet informing and convincing him that nothing is really wrong.

Sunbright-Knoxville Line to Get Under Way Shortly

According to press reports from the district, plans are practically complete for the construction of an 80-mile, 10-inch line from the Sunbright gas field to Knoxville, Maryville, Harriman, Kingston and Lenoir City, Tenn. According to statements credited to S. H. Jones, president of the Public Service Co., of Sunbright, construction will begin in from 30 to 60 days, the state utilities commission having granted permission to build the line. It is estimated that the development will cost in the neighborhood of $500,000. Negotiations are under way with the Knoxville Gas Co., at Knoxville for selling natural at the city gate for distribution there.

Franchises have already been granted in Maryville, Harriman, Kingston and Lenoir City, according to the report.

North Central Gas Co. Conducts Consumer Contest in November

North Central Gas Co.'s consumer publication "Flame" in November sponsored a contest in the company's territory of Nebraska and Wyoming, with the closing date given as December 10, and a Ruud water heater as first prize. A radiant-type heater was the second prize.

Upham Buys Humphreys' Franchise

D. A. Upham, president of the McLean Gas Co., McLean, Texas, has purchased the franchise recently granted to D. W. Humphreys in the town of McLean.

Burkesville, Ky., on Gas Service

Burkesville Gas Co. is now serving natural gas at Burkesville, Ky., the supply coming from wells near the town.

W. T. Barbour
President

John A. Fry
Vice President and General Manager

WAIT JUST A MONTH...

It will be to your profit

In *February*, the new Detroit Jewel and Garland will be introduced for your inspection and approval

For 1933, the Detroit-Michigan Stove Company wants you to have a line of gas ranges that will be good enough for 1935. And that is exactly the kind of gas ranges we are prepared to offer—but not until February.

This is a departure from custom in the gas range industry, which generally introduces new ranges in January—but the new Detroit Jewel and Garland is a departure from custom, too.

Something new and something better is on the way. Every present-day trend and requirement has been studied and analyzed—and the new ranges have been designed and built to meet them.

New dimensions have opened the way to increased beauty of line and contour. New colors enhance the appeal to the eye—and the appeal to the desire to *buy*. New conveniences, with added efficiency and economy provide you with "talking points" that will help to boost sales.

So wait. Wait just one month—until February—and you'll be well repaid.

W. T. Barbour
President

John A. Fry
Vice President and General Manager

Detroit - Michigan Stove Company • **Detroit, Michigan**

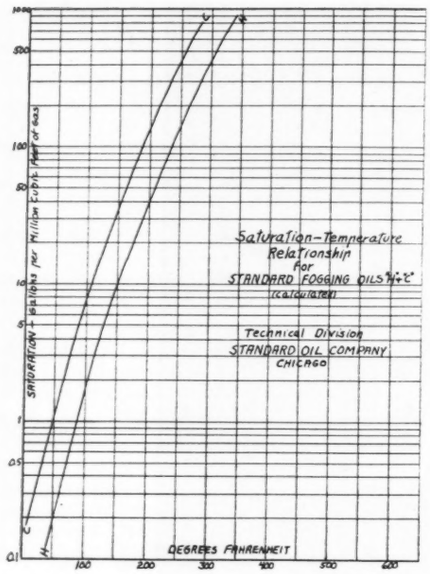


Fig. 1.

Fogging Oils

(Continued from Page 12)

criteria concerning purchase specifications. It has been our experience with many industries which purchase petroleum products to find items in purchase specifications which are unnecessary and have no connection with the specific use of the material. When such items are met, no benefit derives and cost is increased by the elimination of oils which could be used based on actual requirements.

With special reference to fogging oils, specifications with respect to chemical nature —"olefines", "paraffines", "aromatics", and "naphthenes"—come within this classification. Oils made from various types of crudes often differ considerably in their chemical makeup for the same boiling range or viscosity. This is particularly true of the so-called "olefine content." The word "olefines" is a common name used to include generally a large group of unsaturated hydrocarbons belonging to the ethylene series. These hydrocarbons are usually characterized by relatively poor stability toward oxidation and by tendency toward polymerization to form gummy or asphaltic deposits, although many are quite stable in this respect.

In analysis, olefines are ordinarily determined by treating the oil with concentrated sulphuric acid of specific strength under variable test conditions and measuring the volume of oil lost or absorbed. Unfortunately no regular procedure has been devised suitable for specification purposes, and many hydrocarbons and substances are removed from the oil other than olefines. In addition, many simple olefines and other unsaturated hydrocarbons not readily susceptible to gum formation give sulphonated products which are *soluble in the acid layer,* whereas hydrocarbons including some olefines which are particularly susceptible to gum formation give a mixture of solid polymers and sulphonated material *soluble in the oil layer.* Therefore it is extremely likely that the usual olefine test does not show the constituents of the oil which are likely to form gums inasmuch as they are not lost to the sulphuric acid, but are dissolved in the oil. If this loss to sulphuric acid or olefine content is taken as a measure of stability of an oil toward gum or asphalt formation an entirely erroneous conclusion is likely to be reached.

Some olefines which are responsible for gum formation in gasoline, because of their low boiling points, do not occur in petroleum oils which are suitable for use as fogging s and have high boiling ranges. Certain olefines or unsaturates occurring in manufactured gas, as will be seen later, are very unstable and are potent sources of gum. Such products by all means should be legislated against as constituents of fogging oil. The olefine test is certainly not a means of doing this. What test methods would be applicable it is not possible to state at present, although the Sligh oxidation test or variations thereof offer promise. At any rate oils of boiling ranges now specified (see Table No. 1) if properly acid treated to remove unstable bodies, will not contain gum forming olefines or form asphaltic deposits regardless of the loss to sulphuric acid in the olefine test. Many specifications limit olefine content by analysis to 10 per cent maximum. Many good oils for fogging purposes which have come to our attention show an olefine content of about 20 per cent by the method of analysis. As a matter of fact, none of the commercial oils so far examined meet a 10 per cent maximum olefine content item. The need therefore, seems to be for a test which will eliminate gum forming bodies entirely without respect to the total content of so-called olefines which tells us nothing. For present purposes a statement in specifications that the oil should be a fully refined, acid treated or clay treated distillate would be of help, although this is open to the objection that it is not possible to check entirely. On this question, one would seem to have to rely on the integrity of the supplier.

That fogging oils appear to have little if anything to do with gum formation in gas distribution systems is indicated in recent work by a number of investigators in the field. Recent published articles in the September and November issues of Industrial and Engineering Chemistry for 1932, by Fulweiler and others of the United Gas Improvement Co. are very illuminating with respect to gum formation.

TABLE NO. 1. BOILING RANGES FOR FOGGING OILS

	Hot Fogging Oil	Atomizing (Cold) Fogging Oil
Initial Boiling Point	585°F. Min.	495°F. Min.
50% Point	650°F. Min.	540°F. Min.
90% Point	750°F. Max.	.....
End Point	.....	675°F. Max.

TABLE NO. 2. DISTILLATION OF OILS USED IN SATURATION DATA

	Hot Fogging Oil	Cold Fogging Oil	Gas Oil
Initial	585°F.	522°F.	410°F.
50% Point	680°F.	570°F.	550°F.
Maximum	750°F.	660°F.	750°F.

From a practical standpoint with respect to the type of oil to use for fogging, the boiling range is all-important with respect to the amount required to saturate the gas. Inasmuch as the gas must be saturated with the oil vapor before oil will appear as fog, it is important to secure some idea of the amounts required to saturate at the gas temperature in question. Such information is difficult to determine experimentally because of the very low vapor pressures of petroleum oils used for fogging at atmospheric temperatures. Vapor pressures may be calculated with a fair degree of accuracy. Results are comparable for various oils, any errors introduced by the methods used being the same in each case.

From the volatility or more properly "saturation" chart (Fig. 1) of two oils especially prepared for fogging, it is seen that at 40°F. approximately 0.12 gallons of hot fogging oil and approximately 0.75 gallons of a cold fogging oil are required to saturate a million cubic feet of gas. Calculated on the same basis, a gas oil used by one concern would require 11.9 gallons to saturate a million cubic feet of gas. The boiling ranges of the three oils are given in Table No. 2.

If about 200 per cent saturation is required to secure satisfactory fogging, about 25 gallons of the gas oil in question would be necessary per million cubic feet. The concern in question found it necessary to fog 25-30 gallons. It is reported that 2-5 gallons per million cubic feet of the specially prepared oils will give satisfactory fogging, which seems reasonable in view of their saturation characteristics. On this basis, the use of gas oil of the character shown which is an average figure for most gas oils, appears quite expensive in comparison with prepared oils of the boiling ranges indicated. Taking into consideration the variable nature of commercially available gas oils, the fact that they are more likely to give troubles from deposits in the fogging devices because of poorer stability, and that much oil is likely to be deposited in the drips, the use of prepared fogging oils is to be preferred.

Northern Gas and Pipe Line May Build 200-Mi. Line in Minnesota

Northern Gas and Pipe Line Co., Omaha, Neb., is reported making preliminary surveys for a line to extend from Sioux Falls, S. D., to pass through Luverne, Slayton, Pipestone, Fulda, Worthington, Jackson, Windom, Fairmont, St. James, New Ulm and Mankato, Minn., and eventually to tie in with the company's existing line from Mason City, Iowa to Owatonna. The line, according to this reported route, would be close to 200 miles long, and would serve a large population area in addition to the towns named.

Hugh Hale Asks Permission to Build Carrier for Industrial Service

Hugh Edward Hale of Kansas City, Mo., is reported to have filed an application to construct a natural gas transmission line for serving Kansas City industrials with gas from his holdings near White Church, 10 miles west of Kansas City.

"The sale of GAS REFRIGERATION is the *one way* notably effective at the present time to hold and safeguard the gas load."

This is the statement of

CYRUS BARNES

of Charles H. Tenney & Co.
Boston, Mass.

Chairman, A.G.A. Committee on Refrigeration

NO ONE will deny that one of the biggest problems facing the gas industry in 1933 is maintaining the domestic load. As a result, astute gas executives have been quick to grasp the importance of Electrolux in achieving that end.

Writes Mr. Barnes: "Three things make the intensive sale of Electrolux vital to the well-being of a gas company—yes, and of the gas industry—in 1933. First: Electrolux adds to a customer's present requirements the equivalent of the old lighting load—without a cent invested in new equipment. Second: because women *want* automatic refrigeration, and will buy an automatic refrigerator before they purchase replacement equipment, there is a readier market for Electrolux than for any other gas appliance. Third: once installed, Electrolux revitalizes the picture of gas in the customer's mind. Now she *knows* gas is a modern automatic servant. Electrolux has kept her as a customer, not only for refrigeration but also for cooking, for water-heating, and for the future developments in the use of gas."

Will you *re-read* Mr. Barnes' three points? Then live with them a few days. Talk them over with your colleagues. And when you have reached agreement with the sound logic of their presentation—and have decided to act in accordance with them—won't you get in touch with us immediately. We want to cooperate with you to the fullest extent. Electrolux, in the limelight of your sales and merchandising effort for 1933, *can* and *will* help immeasurably to hold and increase your domestic gas load! Electrolux Refrigerator Sales, Inc., Evansville, Ind.

A tiny gas flame makes constant, steady cold

ELECTROLUX

THE *Gas* REFRIGERATOR

Set to Sell Air-Conditioning in Kansas

(Continued from Page 11)

portance this spring and summer. Last month came the announcement from Major T. J. Strickler, vice-president and general manager of the Kansas City Gas Co., that active promotional work is being begun at once, centering upon education of sales force, development of prospects, and other advance steps which will lay the way for a resultful sales activity a few months hence.

Major Strickler has delegated Ramon R. Houser of the Kansas City Co. new business department to direct the company's air-conditioning sales program. Mr. Houser's work will be in connection with both the commercial and domestic units, in Kansas City, Mo., and possibly Kansas City, Kan. While the first efforts will go toward sale of commercial units in office buildings, stores, eating places, etc., the company contemplates setting up a domestic air-conditioning display in its Kansas City general offices. Mr. Houser is now engaged in surveying the immediate market and in examining thoroughly into the equipment and requirements of the air-conditioning process. Educational work for the benefit of other new business department salesmen in Kansas City has also been put under way, covering instruction on the demonstration commercial unit now operating at the Country Club office, and the holding of classes in air-conditioning fundamentals.

Accompanying this article are five views of the Country Club office air-conditioning unit, and the following description of these is provided through the courtesy of C. D. Greason of the Gas Service Co.:

No. 1: This view shows the gas-fired boiler which supplies the steam for the ejector system for summer cooling and also steam for the unit for heating in the winter time. The pumps and other apparatus shown in the picture are used in connection with the cooling system. The central pump and float tank are for returning the water to the boiler when the cooling system is operating. The other pump shown in the picture is for circulation of the condensing water.

No. 2: End view of the steam ejector unit. The insulated pipe in the foreground carries the steam to the unit. The upper shell is the evaporator unit which cools the water used in the cooling system. The lower drum or shell is the steam condenser. The pipes shown connected to the end of the lower shell are the condensor water pipes.

No. 3: Cooling tower unit for cooling the condensing water, erected at the rear of the Country Club Office building.

No. 4: A close-up view of the heating and cooling air-conditioning unit in the customer, office room and display floor. The two distributor grills for the condensed air are suspended from the ceiling. The thermostat and hygrometer can be seen attached to the grill on the cashier's cage. This apparatus automatically controls the summer and winter temperatures and the relative humidity in the room.

No. 5: Duct and air distributor grill for heating, cooling and air conditioning the basement assembly room where cooking demonstrations and parties are held. This distributes the conditioned air to the basement assembly room from the display air-conditioning unit in the customer's office room, shown in view No. 4.

Pioneer work such as that at Kansas City offers the best possible evidence that responsible gas interests see a tangible market for gas in the air-conditioning field. Correspondence courses in air-conditioning such as those now being conducted by Johns Hopkins University and Rutgers University should be taken advantage of by sales and engineering branches of the industry, so that the sales activity which will soon be in motion will not be handicapped by inadequately trained personnel. Manufacturing organizations, many of which have been experimenting superficially with the air-conditioning idea, should speed their work and offer the results to the industry. Not until all of these essential factors are right will gas fuel come into its own in air-conditioning.

"Football Contest" Held by Minnesota Northern Power Co. Brings Results

Results of the "Football Contest" held by subsidiaries of Minnesota Northern Power Co. and reported fully in the November issue of *Western Gas,* have been tabulated, and are released by A. E. Schwarz, commercial manager for Minnesota Northern. Williston, N. D., finished first with 981.1 points, Bismarck was next with 841.55 points; and Black Hills third, with 697.9. The contest covered three months. Contest officials were W. L. Hayes, F. R. Gamble and C. W. Smith, of the company's executive staff, acting in the capacities of "referee," "umpire" and "headlinesman."

Total gas appliance sales for the contest in all districts were: 54 floor furnaces, 236 conversion burners, 43 furnace or boiler installations, 312 circulating heaters, 407 radiant-type heaters, 268 gas ranges, 146 water heaters.

Edwin Ruud, President, Ruud Manufacturing Co., Passes

Edwin Ruud, president and founder of the Ruud Manufacturing Co., Pittsburgh, Pa., died on December 9 at his home in Pittsburgh.

Mr. Ruud was born in Norway, June 9, 1854, coming to America in 1880. In 1887 he became affiliated with the Westinghouse interests. Eventually Mr. Ruud developed his water heater and founded the company for its manufacture.

Honorary pall bearers were H. R. Basford, W. H. Kapus, H. S. Humphrey, F. A. Lemke, H. T. Peterson, C. E. Bartlett, A. H. Wardell, G. H. Stengel, A. P. Brill, E. B. Scull, Max Cartall and J. C. Dyer.

Provisions of Mr. Ruud's will included bequests of $1,000 to each 10-year employee, and $2,000 to each 20- year employee.

"Better Copy" Contest on 1932 Advertising Now Under Way

The annual "Better Copy" contest of the Public Utilities Advertising Association is being conducted this year, according to announcement made by the Association following a meeting of the board of directors on November 29.

F. W. Crone, 4 Irving Place, New York, N. Y., has been selected as chairman of the committee to handle the contest. Copy dealing with any feature of utility advertising published between January 1, 1932, and December 31, 1932, including newspaper and outdoor advertising, is eligible for entry in the contest.

Awards will be made for the best single advertisements, outdoor displays and window displays in each class except the campaign advertising class, which will include the best series of advertisements, institutional, appliance or sales promotion, and open to gas, electric and transportation companies.

Natural Gas for Laramie Planned by Ohio Oil Co.

Plans for taking natural gas from the Dutton Creek field to Laramie, Wyo., by the Ohio Oil Co. and the Illinois Pipe Line Co. are shaping up. John McFayden, vice-president and general manager of Ohio Oil, and P. J. Hennessey, general superintendent of Illinois Pipe Line Co., were in Laramie recently making a survey for the route of the line to be laid to connect the oil line from Dutton Creek to the environs of Laramie with the city's distribution system. The line is to be reconditioned for gas service. The gas would be served there by the Laramie Gas Co.

Texas Cold Snap Reflected in San Antonio Company Send Out

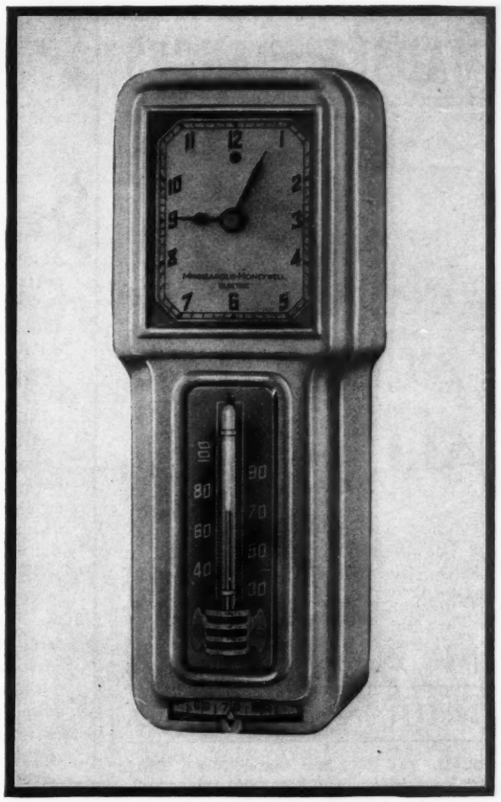
Average daily consumption of natural gas in San Antonio, Texas, was 30 per cent higher in December, 1932, than December, 1931, according to D. A. Powell, vice-president and general manager of the San Antonio Public Service Co. The average daily send-out for December, 1932, was 14,000,000 cubic feet as compared with 10,770,000 cubic feet for the same month of 1931.

North Central Gas Co. Sponsoring Radio Broadcasting Program

North Central Gas Co., Scottsbluff, Neb., is sponsoring a radio program over station KGKY each Monday, Wednesday and Friday evening, offering a quarter hour of musical entertainment and talks on the uses and benefits of natural gas.

The Best is Always Standard

STANDARDIZE *on* MINNEAPOLIS-HONEYWELL



ELECTRIC CLOCK THERMOSTAT

IN EVERY FIELD, there is always the "standard" . . . In the control field, this standard is Minneapolis-Honeywell . . . standard because of its importance in the industry, its size, its scope, its 48 years of control experience and research and the completeness of its line . . . . You can be sure when you recommend and install Minneapolis-Honeywell controls that you have selected not only the best but the standard . . . . You can be sure that these controls can be easily serviced in the future, no matter how distant. You can keep your service department stocks and costs at a minimum by standardizing on controls which enable your crew to service every call instead of but a part of them . . . . Standardize on Minneapolis-Honeywell. The best is always standard.

LOW LIMIT CONTROL
Will eliminate "Cold 70°" due to cold air piling up on floor, and stratification caused by intermittent firing

MINNEAPOLIS-HONEYWELL
Control Systems

Minneapolis-Honeywell Regulator Company. Executive Offices: 401 East 28th Street, Minneapolis. Factories: Minneapolis, also Elkhart and Wabash, Indiana. Branch and Distributing Offices: Akron - Allentown - Baltimore - Bloomfield Boston - Buffalo - Butte - Chicago - Cincinnati - Cleveland - Dayton - Denver Detroit - Duluth - Grand Rapids - Hartford - Indianapolis - Jackson - Kansas City Los Angeles - Lowell - Madison - Milwaukee - Minneapolis - Montreal New York City - Niagara Falls - Peoria - Philadelphia - Pittsburgh - Portland, Me. Portland, Ore. - Providence - St. Louis - Salt Lake City - San Francisco Springfield - Syracuse - Toledo - Toronto - Washington - Wichita - Worcester Youngstown. Canada: Minneapolis-Honeywell Regulator Company, Ltd. Toronto and Montreal. Export: New York City. Cable Address: "Laboramus."

MADSEN RANGES

"CUISINE"
"CLUB"
"BUFFET"
"COMMISSARY"

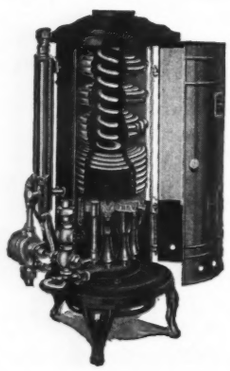
ALL FOR GAS
ALL FOR HEAVY DUTY SERVICE

To Promote MADSEN is to Promote GOOD EQUIPMENT Which Makes Friends for Gas.

MADSEN
IRON WORKS, LTD.

P. O. Box 601, Huntington Park, Calif.
(Suburb of Los Angeles)
MADSEN HOTEL AND RESTAURANT KITCHEN EQUIPMENT
Sold by Leading Equipment Dealers

HOFFMAN



Low Prices alone mean little but Low Prices and High Quality mean everything. You can make money with HOFFMAN.

Details on request.

THE HOFFMAN GAS & ELECTRIC HEATER CO.

1701 Dixie Highway
Louisville, Kentucky

A Forum for Substructure Problems

(Continued from Page 10)

membership includes representatives from the following departments of the City of Los Angeles: Board of Public Utilities and Transportation, Bureau of Engineering, Bureau of Power and Light, Bureau of Water Works and Supply, Bureau of Street Traffic Engineering, Bureau of Street Lighting, Park Department Forestry Division. The Los Angeles County Road Department is also represented. The Bureau of Engineering, City of Los Angeles, has published a reference book covering the Substructure Committee's organization and purposes, and giving information on municipal improvement notices, pertinent ordinances, etc. Quoting from the introduction to this publication:

The further purpose of this committee is to coordinate necessities of all parties so that the highest type of public service may be rendered at the lowest ultimate cost with the least possible conflict in construction and maintenance operations. This includes allocation of space for substructures prior to permanent improvement of streets and the installation of those substructures concurrently with the improvement insofar as may be practicable. The Committee cooperates with contractors on public work, eliminates unnecessary delays, devises ways and means to give the public the maximum use of the streets for traffic and other purposes with the least possible interference, due to the installation and maintenance of substructures.

It has been found that the most effective manner of forestalling disturbance of newly-laid pavement is through advance notification to the utilities of pending improvements and securing their cooperation in placing their new structures (anticipated or needed) or making repairs or changes in existing ones prior to actual paving. This notification method consists of a series of three notices sent by the Bureau of Engineering to all utilities in the City of Los Angeles, as follows:

1. The first notice is sent whenever an ordinance of intention is passed by the Council for paving a street. As a rule, this notice virtually amounts to the equivalent of four months' advance notice of pending improvements, and is intended as an added precaution and emphasis supplementing similar notices published in the Daily Journal.

2. The second notice is sent when the Council passes final ordinance.

3. The third and last notice is sent when award of contract is made by the Board of Public Works. This latter notice is sent in duplicate and requires the utility to return the duplicate within 15 days with notation thereon as to whether or not it intends to make any changes or installations. In case of an affirmative reply, notice of such fact is communicated to both the Construction Inspector of the Engineering Bureau as well as the contractor, so that each may schedule utility operations at the proper stage in the improvement.

In addition to the above notices, specifications No. 137 of the City of Los Angeles require city contractors to notify the Bureau of Engineering when a grade for streets has been completed or if filling is necessary he is required to notify the Bureau of Engineering of his intended date of completion of such work. The Bureau of Engineering then notifies the utilities that they are allowed at least 10 days in which to make contemplated changes or installations.

In this manner and with the cooperation which has been effected between the Bureau of Engineering and its contractors, and the public utilities, the conduits, mains and services are placed in all streets prior to the paving thereof and thus paving cuts and excavations soon after completion of pavements are reduced to the minimum.

Some such advisory organization as the above-described Substructure Committee would seem to be a primary necessity in every sizeable community, where the sub-surface structures become complex. In the Los Angeles seven-year experience this committee organization, bringing together utility, city and county, and contractor interests, has proven invaluable.

Czarniecki Named General Sales Manager for Myers

M. J. Czarniecki, formerly manager of tubular sales of A. M. Byers Co., has been appointed general manager of sales. In announcing the promotion, H. W. Rinearson, vice-president of the company, stated that the move had been necessitated by the departmentalizing of sales activities due to the new lines of wrought iron products developed by A. M. Byers Co. within the past year.

The company has manufactured principally wrought iron tubular goods for the past 68 years but has recently added plates, sheets, structurals, rivets, forging iron and welding fittings, etc., to its products.

Michigan Natural Gas Corp. Gets Permit to Build Line

The Michigan Natural Gas Corp. has received permission from the Michigan Utilities Commission to construct a gas transmission line from the Central Michigan gas field to Saginaw and Bay City, Mich., where the gas will probably be purchased by the Consumers Gas Co., now serving manufactured gas in these two cities. In the permit, the commission stipulated that construction of the line should start not later than six months from December 20, the date of granting the permit, and should be completed within four months from the date of beginning construction.

According to press reports from the district, it is expected that the line will be completed and in operation some time during the Spring months.

A SIMPLE LESSON in TIE-IN Advertising

1. The function of P. G. and E. advertising is to TELL people

   WHY they should buy
   —not to sell.

2. Local tie-in advertising TELLS

   WHO you are
   WHERE you are
   WHAT you sell

Example—How tie-in advertising added to P. G. and E. publicity does a good SELLING job.

PACIFIC Gas and Electric Company publicity-advertising is planned in advance in order to sustain a consistent effort throughout the year.

An exceptionally sound campaign telling people why they should buy gas appliances will be carried on aggressively during 1933. We believe it is a planned campaign that merits unusual promotion.

Each month an advance announcement of the advertising plans of this company goes to thousands of dealers and newspaper publishers in the form of our Dealer Broadside. This Broadside, mailed free to dealers, tells the complete story of advertising for the month ahead, with large, readable reproductions of our newspaper advertisements, window displays, billboards, and bill stickers.

Any P. G. and E. office or your local newspaper publisher will gladly go over the matter of tie-in advertising for local dealers in detail, and plan advertising to meet special requirements.

Tie-in with P. G. and E. advertising for greater sales and greater profits in 1933.

W. G. 213-133

P · G · and E ·

PACIFIC GAS AND ELECTRIC COMPANY

OWNED . OPERATED . MANAGED BY CALIFORNIANS

Sales Offensive Opens in No. California

(Continued from Page 15)

Bureau, stressed the necessity of "teamwork" on the part of all branches of the industry. The well-being of each branch is so dependent upon the prosperity of each of the others that complete success can be attained only by close cooperation.

H. M. Crawford, general sales manager of the Pacific Gas and Electric Co., gave a brief outline of the plans of his company to promote new business in 1933. Estimating the potential market for new gas equipment in Northern California at 52 million dollars, Mr. Crawford stated that the Pacific Gas and Electric Co. would continue its efforts to assist the dealers to acquire this business. He estimated that 250,000 homes on the gas lines in Northern California lack automatic water heaters, 50,000 still use coal, wood, or oil for cooking, and that there is a 26-million dollar market for gas heating equipment. On the basis of $100 average sale he pointed to a 5-million dollar gas range market in new sales, and a large replacement market for the company's 400,000 customers now using gas ranges. The water heater market, at an average of $85 per sale would approximate another 21 million dollars, this water heating field representing the most undeveloped market in the gas business, in view of its age, according to Mr. Crawford.

To indicate how large a factor the dealer is in gas sales in Northern California, Mr. Crawford said that annual dealer sales of gas appliances in the P. G. and E. territory amounted to $5,000,000, consisting largely of gas ranges, circulating heaters, furnaces and water heaters. There are 552 retail outlets selling heating and 386 retail outlets selling ranges in in the company's area. Total sales expenditures, gas and electric, by P. G. and E. for 1933 are budgetted at $2,000,000, said Mr. Crawford, with $400,000 additional for advertising. Roughly, half of these amounts will be devoted exclusively to gas sales promotion.

The principal talk of the evening was delivered by G. A. Lenoir, manager of home furnishings of the Emporium. Mr. Lenoir, a veteran in the home furnishing field, made an eloquent plea for a return to the fundamental principles of successful merchandising. The present ruinous competition in price and particularly competition in credit terms are believed by Mr. Lenoir to be strong factors in preventing business revival.

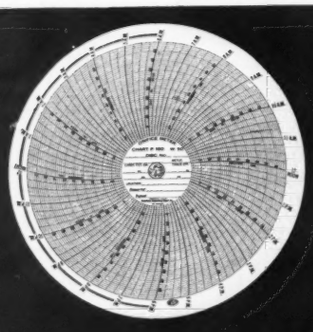
Organization Conference

The various meetings of sections which comprised the Organization Conference of the Pacific Coast Gas Association took place on December 14 and 15. The decisions made as to plans and organization are outlined elsewhere in this issue by the Section Chairmen. The program of these meetings was published in December *Western Gas*. Several papers read before the Joint Commercial and Technical Section meeting on December 14 and before the Technical Section on December 15 are reproduced elsewhere in this issue.

In conjunction with the Home Appliance Exposition the P. G. and E. held an annual sales dinner, presided over by A. F. Hockenbeamer, president of the company. The dinner took place in Larkin Hall at the San Francisco Civic Auditorium, and brought together some 600 company executives, department heads, and employees.

R. E. Fisher, commenting upon the load building activities in prospect for 1933, stated that a sales promotion force of 519 will be maintained by the P. G. and E. and its subsidiaries, the greatest number in the company's history. Mr. Fisher also summed up 1932 sales accomplishments on the consolidated company system with the statement that $9,234,424 worth of new business had been added.

P. M. Downing, vice-president and general manager, reported that the consolidated system's electric business in the year ending November 30, 1932, showed a decrease of 12 per cent as compared with the preceding twelve months. In the same period gas consumption on the Pacific system showed an increase of 14.8 per cent in the case of do-



All dimensions of ARCCO Orifice Meter Charts are STANDARDIZED

•

Planimeters and integrating machines need NOT be re-set to varying zero radii

•

AMERICAN RECORDING CHART COMPANY

MUtual 9183 LOS ANGELES, CALIFORNIA -428 Boyd Street

NO-OX-ID IRON-RUST

The Original Rust Preventive

GAS HOLDER • SEAL •

The effectiveness of NO-OX-ID Gas Holder Seal is well reflected in the following report from Dearborn Representative A. A. Turner of Minneapolis:

"Had a very satisfactory call on Mr. A—— this A. M. He told me that he is certainly well pleased with the Gas Holder at R——, which is coated with our Water Seal No. 3. About a year ago we put in about two drums for a test, they just put in two drums more and Mr. A—— says that the holder is in excellent shape.

"Mr. A—— also informed me that about three years ago they coated the inside of the gas purifier with NO-OX-ID 'A Special' at their F—— plant. This was inspected recently and found to be in a fine condition."

Tell Dearborn of your rust problems. Recommendations and estimates submitted gladly.

DEARBORN CHEMICAL COMPANY

LOS ANGELES:
807 Mateo Street, Phone TRinity 3385
SAN FRANCISCO
421 Bryant St., Phone SUtter 8688

SOUTH CHESTER STEEL PIPE

Excels for Gas Service

The unusual care given to accuracy of diameter and welding qualities, makes Chester Pipe a favorite for gas lines.

SOUTH CHESTER TUBE CO.
Chester, Pa.

mestic and commercial consumers and 17.7 per cent in the case of large industries. On the San Joaquin system the gas sales increases were 14.4 per cent and 33.2 per cent respectively. These gains were accomplished, Mr. Downing explained, by extensive work in the development of new uses for gas.

While on the subject of difficulties encountered in maintaining revenues, Mr. Downing cited the fact that rate reductions since February 15, 1928, have reduced consumers bills $15,900,000 a year. Gas consumers' savings amount to $10,000,000 yearly, due to reduced rates and the introduction of natural gas with a heat content more than double that of manufactured gas; electric consumers' savings are $5,900,000 a year.

A. F. Hockenbeamer, president of the company, presented to the San Francisco Division his trophy for the most outstanding performance in load building sales during the year. He also congratulated 230 salesmen who attended the dinner as honor guests as a reward for exceeding their sales quotas in the past three months.

A. C. Joy, advertising manager, announced a substantial increase in the P. G. and E. advertising budget for 1933 as an important feature of the widespread drive for business. The company, he stated, will spend $400,000 for advertising, the bulk of which will go for newspaper space. Other mediums will include billboards, direct mail, truck posters, cooking schools, etc.

Council Bluffs Reports $100,000 Gain in Gross Income in 1932

Gross income of the Council Bluffs Gas Co. of Council Bluffs, Iowa, for 1932 will exceed that of 1931 by approximately $100,000. Figures of the company show that more than 1,000 homes, or about one in every 10 are using the new fuel for house heating. Gross income for 1931 was $272,023.80 as compared with $368,350.59 for 1932.

McMinnville, Tenn., Now On Natural Gas Service

McMinnville, Tenn., is now supplied with natural gas from the wells of the Walker Oil and Gas Co. about 4 miles from the town. The gas will be served by the McMinnville Gas and Heating Co.

Austin Gatlin of Ashland Ky., recently bought the controlling interest in both the pipe line company and the distribution unit.

Oil-Gas Equipment to Replace Coal-Gas at Princeton

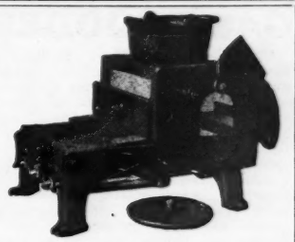
Princeton Gas Co., Princeton, Ill., plans to install new oil gas equipment in its plant, taking the place of the coal gas equipment now used. Cost of the improvement will be about $15,000.

Stout Replaces Boyle on Commission

Appointment of Congressman Tom Stout of Lewistown, Mont., to serve on the Montana Railroad and Public Service Commission was announced late in November. Mr. Stout takes the place of Daniel Boyle, resigned.

For Men Who Are Cutting Costs

No. 118 Bench Furnace



The Johnson No. 118 Combination Bench Furnace is a model of efficiency. This small unit is designed to heat soldering coppers, melt soft metals and for heat-treating, annealing, and tempering. This furnace will adequately serve all the requirements of a small shop. Write for our catalog.

Johnson No. 305 Melting Furnace

A special draw-off valve which permits easy removal of molten metal, is one of the features of this sturdy melting furnace. Has a capacity of 300 lbs. of lead. Powerful Johnson Burners melt metal in extremely short time. No blower is needed. Write for the Johnson catalog and price list.

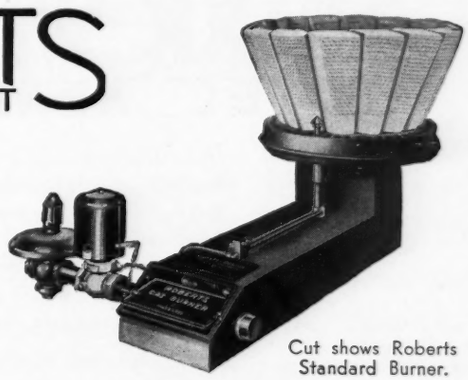
JOHNSON GAS APPLIANCE CO.
Cedar Rapids IOWA

Pacific Coast Representative—C. B. BABCOCK CO.
135 Bluxome St., San Francisco, Calif.

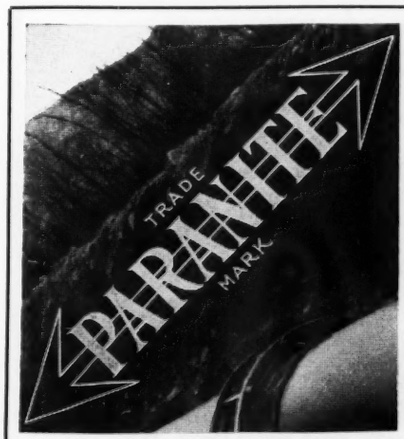
ROBERTS CONTROLLED GAS HEATING UNIT

ROBERTS-GORDON offers a complete line of conversion burners for heating the smallest home or largest commercial building.

ROBERTS-GORDON APPLIANCE CORPORATION
BUFFALO, N. Y.



Cut shows Roberts Standard Burner.



OVER 10,000,000
have gone down to STAY!

The *permanent dependability* of Paranite Pipe Joint and Leak Clamp Gaskets has been indisputably established as a matter of record—in every type of gas line service—for the past 20 years. Paranite Gaskets are the most permanent gaskets known today.

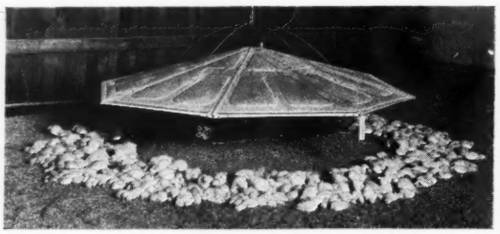
It's Safest to Specify Paranite
The Manhattan Rubber Mfg. Division
of Raybestos-Manhattan, Inc.

Executive Offices and Warehouses,
Passaic, New Jersey

GAS BROODERS

The new type Hart Radiant Gas Brooders are causing a sensation amongst poultrymen. They are proving by far the best means of brooding chicks. Increase your sales of gas by handling this leading line. Hart Gas Brooders will raise a greater percentage of chicks with less labor and expense than any other method. All brooders thermostatically controlled—hang from ceiling—teach chicks to perch—gas pipe runs overhead with flexible gas tubing running to brooder. Get your share of the vast potential fuel load for brooding of chicks and turkeys. One poultryman is worth a dozen ordinary household gas consumers.

Send at once for descriptive literature, discounts, etc.



Flashlight photograph of chicks sleeping under a Hart Gas Brooder at the world's largest poultry ranch where Hart Brooders are used exclusively. One hundred and forty-four brooders in operation the year round brooding five hundred to one thousand chicks to the brooder.

H. W. HART MFG. CO., P. O. Box 404 W, Santa Monica, Calif.

More Hart Gas Brooders are being sold on the Pacific Coast than any other make.

The Goodman Stopper

The Reliable Shut-off for Street Mains

Equipped with Improved Patented Locking Sleeve, which locks both handles to the pipe. Stopper cannot slip. Gas cannot pass.

Safety Gas Main Stopper Co.
523 Atlantic Avenue, Brooklyn, N. Y.

Pac. Coast Rep.: C. B. Babcock Co.
135 Bluxome Street
San Francisco, California

The PARK WILSHIRE HOTEL APARTMENTS

Most desirably situated on Wilshire Boulevard, adjoining beautiful Westlake Park---15 minutes from the city center. By bus directly in front of the building and by three car lines within one block.

•

Apartments from $75 a Month
Also Daily and Weekly Rates

•

2424 Wilshire Blvd., at Westlake Park

•

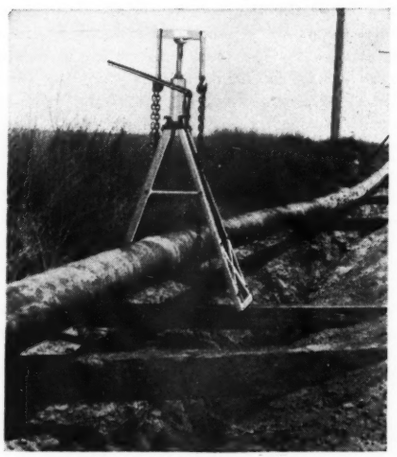
Modern, Home-like and Supremely Comfortable

LOS ANGELES

Adams Lifting Jacks Introduced to the Industry

TWO new jacks for use on pipe line work have recently been introduced by the Adams Manufacturing and Engineering Co. of 2068 Belgrave Avenue, Huntington Park, Calif.

The Model "C" Jack is hydraulically operated and requires one man to operate. It handles any size pipe up to 16-inch and can be used either in the trench or on top of the ground. With a 10-inch lift it will raise or lower pipe the amount required in stages by holding the load with chains on hooks



attached to the frame while the stroke is being changed. It is especially adaptable to lining up for welding; for cleaning, painting and overhead welding; and for all general repair work.

The Model "AA" Jack will raise or lower pipe up to 12 inches in diameter from or into the trench in one operation. This type is ratchet operated and requires two men to handle, set up, carry along the line and operate.

Both models are made to order in larger sizes and information regarding them will be furnished by the makers.

Whittier to Have Four New High Pressure Holders

Southern Counties Gas Co., Los Angeles, Calif., plans to construct four new high pressure natural gas storage holders with a combined capacity of 1,000,000 cubic feet, representing an investment of approxmiately $65,000. The holders will be located at Whittier, Calif.

Mrs. Spencer Resigns as Home Service Director at San Antonio

Mrs. Pearl Spencer, home service director of the San Antonio Public Service Co., San Antonio, Texas, resigned that post in December. Mrs. Spencer was assistant to Mrs. Albertine Berry and succeeded her when she went with the Lone Star organization.

Classified Advertising

Classified advertising five cents per word; minimum $2.00 per insertion. Situation Wanted advertisements up to 50 words will be published three consecutive issues without charge. Small professional cards 1-in. deep by 21 ems wide are $6.00 monthly on 12-time contract.

WANTED—New line or lines. Our business is the manufacture and sale of gas burning heating equipment which is highly seasonal. We desire an additional line or lines for an efficient organization covering sales. service and administration. We have ample warehouse space. Williams Radiator Co., 1865-1875 Cordova St., Los Angeles.

SITUATIONS WANTED—MALE

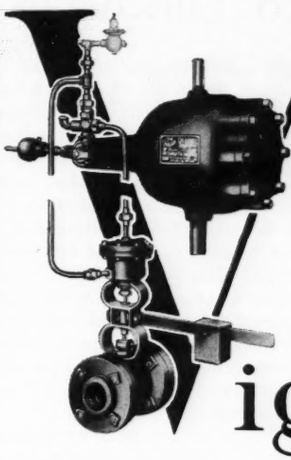
Executive with experience in butane-propane plant construction and operation seeking new connection. Would consider interest in company. Now general manager and treasurer group utilities. Always held responsible positions. Married. Age 45. Can handle men. Will locate anywhere. Address Box E-225, *Western Gas,* 124 West Fourth Street, Los Angeles, Calif.

Wanted, position by young married man, 26 years of age, American, as gas fitter and service man. Applicant is experienced in all types and makes of gas appliances, also conversion and industrial jobs. Address Box E-227, Western Gas, 124 West Fourth Street, Los Angeles, Calif.

Gas fitter, experienced with natural and manufactured gas, desires position. Applicant has had four years experience in appliance installation, including gas furnaces and furnace conversion burners. Can furnish reference. Address Box E-228, *Western Gas,* 124 West Fourth Street, Los Angeles, Calif.

Fisher Governor Co. Opens New Offices in New York City

Fisher Governor Co., Marshalltown, Iowa, manufacturer of automatic controlling devices, announces the opening of a factory sales and engineering office in New York City. The offices will be located at 30 Church St., and will be in charge of: O. M. Galiher, graduate engineer, who has had over six years experience as engineer and assistant sales manager at the factory; A. W. Bailey, who has had charge of specialty sales for Fisher in the New York territory, and J. J. Belger, who also has had several years experience in the Fisher organization.



V-port VALVE

CF

Vigilant

FOR quiet operation at all times when demands are fluctuating, for sure and exact regulation under light loads as well as heavy, a Vigilant Liquid Level Regulator with V-port Valve is recommended. Wide-open, it has a capacity equal to that of the pipe. When flow is at minimum, the distance between valve and seat is still enough to assure free action.
There is a C-F regulator exactly suited to every requirement of gas control. Well known for more than 40 years. Catalog on request.

The Chaplin-Fulton Mfg. Company

Organized 1884—Oldest Builders of Gas Regulators in the Country. Regulators of all Sizes from 1 inch to 24 inches; for all Service, 1 oz. up to 2,000 lbs. pressure to Square Inch.

28-40 Penn Avenue Pittsburgh, Pa.

REPRESENTATIVES

WESTCOTT & GREIS, Inc.
Sales and Service
Dallas — Tulsa

JNO. W. CRAWFORD
Sales Engineer
1855 Industrial Street, Los Angeles

PARSONS ENGINEERING CO.
Los Angeles, Calif. San Francisco, Calif.
Or Any Jobber

FRASER
GAS APPLIANCES AND FURNACES

Announcing—

Two New Large Capacity

FLOOR FURNACES

No. 135 —50,500 B. T. U. Input
No. 135A—57,000 B. T. U. Input

The Complete Line now includes
7 sizes Floor Furnaces
11 sizes Basement Furnaces
2 sizes Wall Furnaces
5 sizes Pipeless Furnaces
5 sizes Console Heaters
Baked or Porcelain Enamel

Write for our new catalog and price list.

Manufactured by

Fraser Furnace Company
Stockton, Calif.
Distributed by
H. R. BASFORD CO. San Francisco Los Angeles

"Antileke"

The hypo-sealed pipe joint saves 20% to 50% in laying cast iron or steel pipe and repairing any ordinary or difficult gas leaks.

Thousands in use without a single failure.

GAS & ELECTRIC FACILITIES, LTD.
447 Sutter St., San Francisco

Send literature and prices on "Antileke"

Name.....

Address.....

City.....State.....

Now...

is the time to check performance of the appliances you have installed in years past.

We welcome the opportunity to have gas companies check Payne Heating Equipment

PERFORMANCE

with any other gas fired heating equipment made. Since 1914 we have made Payne Products to a standard of quality and performance which would appeal to all gas companies—the kind of equipment they would strive to produce if they were manufacturing the equipment themselves.

The Mark Payne *of Quality*

PAYNE FURNACE & SUPPLY CO.
Since 1914
Beverly Hills, California

FISHER TRADE MARK

Use Fisher Gas Pressure Regulators for All Gas Service

Butane, Propane, Natural and Artificial Gas and for All Pressure Conditions

◆

FISHER GOVERNOR CO.

201 South First Ave. MARSHALLTOWN, IOWA
1015 Santa Fe Ave. LOS ANGELES, CALIF.

"Gasco" Luncheons Help Sell Home Service

HOW gas and gas appliances may be used successfully by Seattle housewives in preparation of meals was the story that Seattle Gas Co.'s Home Service Department wanted to tell club women. Mrs. Beatrice Strege and Mrs. Ruth Hopkins, members of the department, decided that the best method to reach the various organizations would be through a series of luncheons.

Since June 28, 1932, when the first luncheon was served in the Gasco Auditorium, there have been 2,242 Seattle club women as guests at 49 luncheons. With the exception of the first engagement, none of these club luncheon dates has been solicited by gas company representatives.

The project was started with two luncheons a week but was later increased to three. At present, there are organizations booked until the second week in June, when the program will be discontinued for the summer months.

Cooperating food manufacturers have made possible this program, assisting the gas company by placing their products at the disposal of the Home Service Department. Credit is given to the various concerns by the home service director, who makes a short talk at the conclusion of each luncheon regarding the products which have been used in its preparation and the use of gas and gas appliances.

No charge except 10 cents cover charge is made to the members of the club. However, most of the clubs raise money at each luncheon by charging 25, 35 or 50 cents per person. The members of the group frequently stay for an afternoon of bridge.

A variety of clubs is represented in the luncheon dates. Lodge auxiliaries, fraternity and sorority mothers' clubs, parent-teachers associations, service clubs, church groups, military post auxiliaries and social clubs are listed in the engagement book.

The program has been strictly an educational one, no sales effort being made. However, it has stimulated interest in Seattle Gas Co. and its products.

S. F. Hayward On 3-Months Trip Around the World

Sterling Fyfe Hayward, the 86-year-old chief executive of the Connelly Iron Sponge & Governor Co., left New York on December 1 for a three and a half months trip around the world, visiting Havana, Cristobal, Los Angeles, San Francisco, Honolulu, Yokohama, Kobe, Shanghai, Hongkong, Manila, Singapore, Colombo, Bombay, Suez, Alexandria, Naples, Genoa, Marseilles and other ports.

Mr. Hayward has been identified with the Connelly Iron Sponge & Governor Co. for nearly 50 years, first as secretary, then as president following the death of Wm. H. McDonald, its president for many years.

Mr. Hayward recently resigned as active head of the company, but continues to serve on the board of directors.

Arthur L. Smyly, who has held the position of Western general manager for 25 years, was elected president.

180-Mile Pipe Contract for Republic Electric Weld

One of the largest pipe orders placed on the Pacific Coast in 1932 was given on December 28 by the board of directors of the Metropolitan Water District, representing 13 cities of Southern California, and calling for 180 miles of Republic electric weld pipe in 5- to 8-inch sizes. The contract was awarded to the Ducommun Corp., Los Angeles, distributor of Republic Steel Corp., Youngstown, Ohio, and involved an expenditure of over $200,000.

R. L. Tudor Named Equity Receiver for 19 Western Utilities

Robert L. Tudor has been appointed equity receiver for the Western Power, Light and Telephone Co., holding corporation for 19 operating subsidiaries in the Middle West. Among other utilities, the company controls Western Natural Gas Co., Western Gas and Pipe Line Co., of Salina, Kan., and Western Gas Co. of Washington, Bremerton and Longview, Wash.

P. G. and E. Gas Sales Rise During Month of December

In the first 19 days of December, Pacific Gas and Electric Co. made gas sales of 1,623,000,000 cubic feet of gas, against 1,509,000,000 in the like period of 1931 in the San Francisco-East Bay metropolitan area. This was a daily average of 82,700,000 cubic feet, against 79,400,000 feet, or a gain of 4.1 per cent. Sales during the first week of December were below the like week of 1931, due to temperature variations, but were offset by the sharp cold wave of mid-December this year. Figures include only actual sales and give no account of gas used by the company in steam plants.

Calif. Commission Recommends Assessment of Utilities

The California State Railroad Commission in its annual report to the Governor recommends that legislation be enacted which will finance the operations of the commission "on the basis of an assessment on the utilities rather than an appropriation from the general fund." Fifteen hundred and nine utilities filed reports with the commission as of December 31, 1931, representing an investment in California of approximately $3,000,000,000.

Texas Panhandle Gas Co. Is Name of Newly Incorporated Company

The Texas Panhandle Gas Co. has been incorporated at Dover, Del., with a capital stock of $1,000,000, to buy, sell and transport natural gas and oil. Roy Carolton of Shamrock is named as the Texas agent for the company.

"MODERNIZE as you repair"

THE SPRAGUE METER COMPANY

Bridgeport, Conn.

Los Angeles, Calif. San Francisco, Calif.

Newark, Ohio.

Davenport, Iowa. Houston, Texas.

Type "A". Built in dead weight type only, with standard pipe inlet and outlet connections. Recommended for inlet pressures not exceeding 2 lbs. per sq. in.

REGULATORS

RELIANCE Type "A" Low Pressure Appliance (or House) Regulators provide positive control of low pressures and are widely used to regulate pressure to water heaters, furnaces, Electrolux refrigerators, etc. On low pressure distribution systems, where it is necessary to boost pressures on peak loads, these regulators are capable of handling large volumes with low differential pressures. Outlet pressures are maintained with a minimum pressure loss through the regulator. Absolute lock-up of pressures, without creeping, when gas consumption ceases, is another remarkable feature of this regulator.

For Prices and Details Address:

RELIANCE REGULATOR CORPORATION

1000 MERIDIAN AVE., ALHAMBRA, CALIF.

Manufacturers of Gas Regulators for All Purposes

REGULATORS YOU CAN RELY ON — RELIANCE — SINCE 1911 — TRADE MARK

R E L I A N C E

DIRECTORY

Byllesby Engineering and Management Corporation

Wholly-owned subsidiary of Standard Gas and Electric Company

231 South La Salle Street, Chicago
New York Pittsburgh San Francisco

MACCO - ROBERTSON
LIMITED
Pipe Line Construction
ORGANIZATION — EXPERIENCE
RESPONSIBILITY
LOS ANGELES CALIFORNIA

SHEER
"HIGH-LOW" (2 stage) Electric Gas Valve for conversion burners, gas furnaces; also Electric Clock Thermostats, Limit Controls, Space Heater Regulators, etc.
Write for Low 1932 Prices
H. M. SHEER CO. QUINCY, ILL.

McWANE CAST IRON PIPE CO. BIRMINGHAM ALABAMA

PACIFIC STATES CAST IRON PIPE CO. PROVO, UTAH

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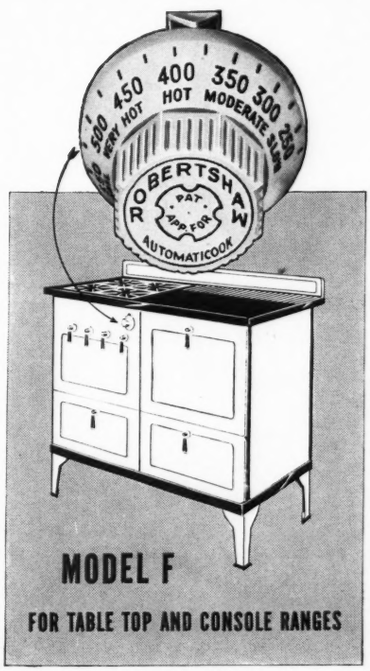

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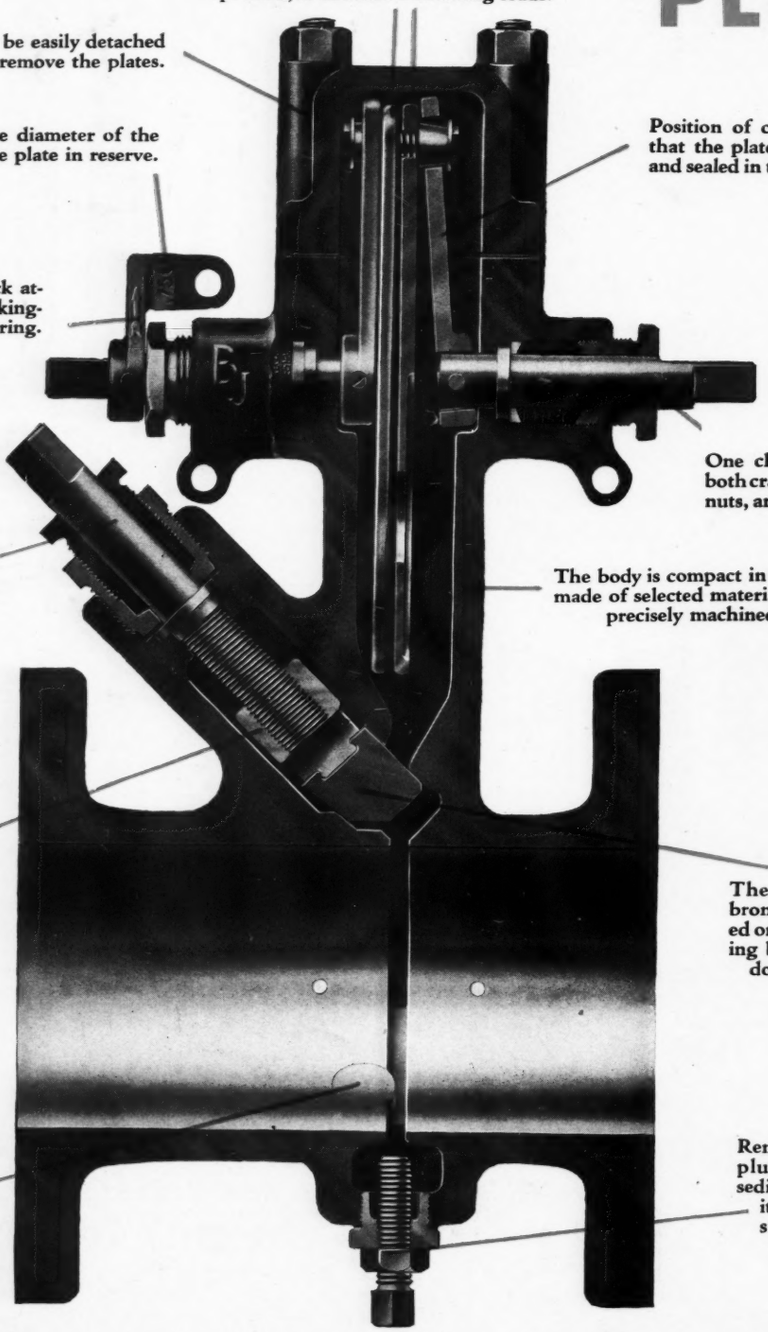
Two enclosed plates, with orifices as specified, to measure fluctuating loads.
The cap may be easily detached to inspect or remove the plates.
Indicators show orifice diameter of the plate in use, and of the plate in reserve.
Position of crank proves that the plate is centered and sealed in the flow line.
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One change-wrench fits both crank-shafts, the cap nuts, and the valve shaft.
The valve shaft is strong; positive in action; and perfectly sealed.
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The equalizer provides uniform pressure along the length of the valve.
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This pin contacts a cam on bottom of the plate, and forces the plate to a tight seal.
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